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### Title

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### Permalink

<https://escholarship.org/uc/item/1jx9b0ws>

### Journal

Emotion Review, 9(3)

### ISSN

1754-0739

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### Publication Date

2017-07-01

### DOI

10.1177/1754073916669596

Peer reviewed

# Functions of Positive Emotions: Gratitude as a Motivator of Self-Improvement and Positive Change

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## Abstract

Positive emotions are highly valued and frequently sought. Beyond just being pleasant, however, positive emotions may also lead to long-term benefits in important domains, including work, physical health, and interpersonal relationships. Research thus far has focused on the broader functions of positive emotions. According to the broaden-and-build theory, positive emotions expand people's thought-action repertoires and allow them to build psychological, intellectual, and social resources. New evidence suggests that positive emotions—particularly gratitude—may also play a role in motivating individuals to engage in positive behaviors leading to self-improvement. We propose and offer supportive evidence that expressing gratitude leads people to muster effort to improve themselves via increases in connectedness, elevation, humility, and specific negative states including indebtedness.

## Keywords

gratitude, happiness, positive emotions, self-improvement, well-being

Positive emotions are widely valued and frequently pursued (Diener, 2000). The human striving toward experiencing positive emotions is reflected in society in a multitude of ways, from ancient Greek texts and romantic poetry to advertisements and modern U.S. song lyrics. We argue here that positive emotions do more than just feel good; they may benefit both the individual and the people around her.

## Happiness and Positive Emotions

Happiness is most commonly conceptualized as characterized by two principal features: an affective component, comprised of the experience of frequent positive emotions (e.g., joy, love, gratitude) and infrequent negative emotions (e.g., fear, anger, sadness), and a cognitive component, reflecting a global sense of life satisfaction (Diener, Suh, Lucas, & Smith, 1999). This definition dovetails with notions of hedonic well-being, as opposed to eudaimonic well-being, which is a more complex construct characterized by personal growth, authenticity, and meaning in life (Ryan & Deci, 2001; Ryff, 1989). Following the

lead of previous researchers, we will use the terms happiness and well-being interchangeably.

Across correlational, cross-sectional, and experimental studies, higher well-being has been linked to positive outcomes across multiple domains, including health, relationships, and work (Diener et al., 1999; Lyubomirsky, King, & Diener, 2005). Via both direct and indirect mechanisms, happiness has been shown to promote improved physical health, higher quality social relationships, greater work productivity, and increased prosocial behavior (De Neve, Diener, Tay, & Xuereb, 2013). Longitudinal work provides evidence that happiness precedes a host of other desirable outcomes, including reduced risk of cardiovascular disease, slower disease progression, higher incomes, and satisfied marriages (Boehm, Peterson, Kivimaki, & Kubzansky, 2011; De Neve et al., 2013; Diener & Chan, 2011). In sum, converging research supports the notion that well-being precedes, correlates, and causes success across several life domains; notably, these effects are often mediated by positive emotions (Lyubomirsky et al., 2005).

## *Positive Emotions Are the Hallmarks of Happiness*

A growing body of research suggests that positive emotions may be a driving factor in the successful life outcomes of happy people. Theoretical work illustrates the benefits of discrete positive emotions for increasing psychological, physical, and social resources. The broaden-and-build theory proposes that positive emotions, although experientially distinct from one another, share a common evolutionary function—namely, to expand the individual’s cognitive scope in order to cultivate personal resources (Fredrickson, 2013). Whereas negative emotions evoke a narrowed cognitive focus, which facilitates survival-oriented behaviors (e.g., escape from danger), positive emotions, such as joy, interest, and gratitude, expand one’s thought–action repertoire. This broadened mindset encourages the creativity, exploration, and resilience that facilitate the development of enduring personal resources and promote personal and community growth. Over time, the benefits of positive emotions begin to accumulate and interact synergistically with broadened cognition, triggering an “upward spiral” toward successful outcomes across an array of life domains. Furthermore, positive affect co-occurs with and precedes a number of behaviors linked to success, including prosocial behavior, coping, sociability, creativity, and positive construal of the self and others (Jacobs Bao & Lyubomirsky, 2012; Lyubomirsky et al., 2005). In this way, positive emotions may be a critical mediator in the relationship between happiness and positive life outcomes.

### *Are All Positive Emotions Equal?*

Despite the many strengths of the research reviewed in the previous lines, a number of conceptual issues remain. Happiness, as it relates to success in life, has generally been examined either as a singular, broad construct, or as the sum of its two major factors (i.e., the affective and cognitive components). Researchers have yet to rigorously unpack these components to examine which aspects of well-being drive positive outcomes. Specifically, although frequent positive emotions appear to serve as a critical link between happiness and success across various domains of life, scientists do not yet know whether the mechanisms underlying this process are similar across all positive emotions, or whether distinct positive emotions function in unique ways to contribute to successful life outcomes.

Research on affective experience has identified at least 12 representative positive emotions: joy, love, gratitude, admiration, elevation, awe, serenity, interest, hope, pride, amusement, and inspiration (Algoe & Haidt, 2009; Fredrickson, 2013). Each of these emotions is theorized to facilitate the growth of specific personal resources. For example, awe is linked to several key benefits, including increased generosity, ethical decision-making, and helping behavior, as well as reduced impatience (Piff, Dietze, Feinberg, Stancato, & Keltner, 2015; Rudd, Vohs, & Aaker, 2012). These outcomes are highly adaptive in social and work domains, and thus are likely to promote future achievement.

For example, theoretical and empirical work has also linked awe with increased humility (Nelson, Chancellor, Cormick, Blascovich, & Lyubomirsky, 2016); a construct associated with success in doctor–patient communication and organizational leadership (Owens & Hekman, 2012; Ruberton, Kruse, & Lyubomirsky, in press). Finally, awe is linked with higher life satisfaction, supporting the notion that the experience of transient positive emotions feeds into the broader construct of well-being, generating an upward spiral between happiness and positive life outcomes (Rudd et al., 2012). Another valuable positive emotion is pride. Classified as either authentic or hubristic (Tracy & Robins, 2007), pride has been associated with the achievement of valuable goals (Tracy & Robins, 2004) and as motivating goal-directed behavior and perseverance on difficult tasks (Williams & DeSteno, 2008). Although research on the benefits of discrete positive emotions is still in its infancy, a clear pattern is beginning to emerge in which the experience of positive emotions serves as a critical mechanism by which happiness is beneficial. It is vital for researchers to examine more closely the unique functions of such positive emotions. As one example, research from our lab has begun to explore the specific functions of gratitude in supporting self-improvement. To this end, our findings are beginning to disentangle how positive emotions might lead an individual to be better, healthier, and more productive.

## **Gratitude**

The importance of gratitude has been recognized for centuries. A core component of most religions, including Christianity, Islam, Buddhism, and Hinduism, the concept of gratitude is widespread and highly regarded in many cultures. Demonstrating its value in society today, parents teach their children to express gratitude at a very young age, and multiple nations have holidays devoted to the expression of gratitude.

### *Definition*

Gratitude is typically defined as a state that requires one to endorse two facts: (a) that one has achieved a positive outcome, and (b) that this positive outcome came from an external source (Emmons & McCullough, 2003). Gratitude, therefore, requires people to acknowledge that their good fortune is attributable to someone else and is most often directed towards another individual (Emmons & Mishra, 2011) or abstract, nonperson entity (Emmons & McCullough, 2003). Researchers distinguish between benefit-triggered gratitude, which is felt in response to a specific action by another person (e.g., “I am grateful that my parents paid for my college education”), and general gratitude, a broader appreciation or thankfulness for what is important and meaningful in one’s life (e.g., “I am grateful for my family”; Lambert, Graham, & Fincham, 2009). In this article, we will focus on benefit-triggered gratitude.

### *Benefits of Gratitude*

Gratitude, like other positive emotions, has been theorized to broaden one’s cognition and behavior, as well as allow one to

build psychological and social resources (Fredrickson, 2004). Trait gratitude is associated with experiencing more daily positive emotions and fewer negative emotions (Kashdan, Uswatte, & Julian, 2006), as well as greater overall well-being (McCullough, Emmons, & Tsang, 2002). Gratitude leads to a number of positive emotional and social outcomes, such as increased feelings of connectedness and greater perceived social support (Wood, Maltby, Gillett, Linley, & Joseph, 2008), as well as less stress (Wood et al., 2008), and fewer depressive symptoms (Lambert, Fincham, & Stillman, 2012). Experimental studies have provided evidence that gratitude leads to greater boosts in life satisfaction and well-being over time (Boehm, Lyubomirsky, & Sheldon, 2011; Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011). In addition to these benefits, we hypothesize that expressing gratitude can motivate one to become a better person.

### *Gratitude Leads to Self-Improvement and Positive Change*

Theory suggests that gratitude should serve as a motivator of self-improvement behavior and positive change. In addition to being pleasant and enjoyable, gratitude has been rated as motivating and energizing (Emmons & Mishra, 2011). Although gratitude is most often felt in response to kindness received, it compels individuals to perform future kind acts not only towards their benefactors, but also towards people uninvolved in the initial interaction (Bartlett & DeSteno, 2006). Gratitude can therefore lead individuals to pay it forward (i.e., upstream reciprocity; Nowak & Roch, 2007). These studies suggest that gratitude compels people towards prosocial or reciprocal action.

Gratitude may also energize people's commitment towards improvement in important life domains, including health, work, and relationships. Little research has directly investigated the role of gratitude as a motivator of general self-improvement, but several investigators have theorized that gratitude should bolster resources for coping with challenge (Emmons, 2007), as well as beneficial behaviors towards oneself (McCullough, Kilpatrick, Emmons, & Larson, 2001) and efforts to use the gifts for which one is grateful (Harned, 1997). Gratitude may lead people to believe they deserve positive outcomes for themselves and are capable of attaining them (Lambert, Graham, Fincham, & Stillman, 2009). Importantly, research has found that gratitude prompts people to make progress towards their goals (Emmons & Mishra, 2011) and has been linked with success in multiple life domains. One experiment showed that gratitude led participants to exercise more—an important self-improvement behavior (Emmons & McCullough, 2003). Gratitude also predicts higher grade point average (GPA) and desire to contribute to society (Froh, Bono, & Emmons, 2010; Froh, Sefick, & Emmons, 2008), as well as increased academic performance and engagement in extracurricular activities in teens (Ma, Kibler, & Sly, 2013). These findings suggest that gratitude is not just a passive emotion, but rather one that can call an individual to action. Gratitude may motivate an individual to engage in a variety of positive behaviors that ultimately lead him to become a better person and more productive member of society. Gratitude may, therefore, lead to positive spirals

that touch not just the individual, but also the people and community around him. However, to our knowledge, no one has explicitly investigated the mechanisms underlying this effect or tested whether the motivating influence of gratitude can be directed towards self-improvement efforts.

Harnessing previous theory and research on gratitude, we posit four paths by which gratitude can motivate one to put forth more effort towards self-improvement and positive change. As shown in our conceptual model (see Figure 1), we predict that expressing gratitude will lead to increases in connectedness, elevation, humility, and specific negative states such as indebtedness, guilt, and discomfort. These outcomes will, in turn, bolster individuals' motivation to improve themselves, thus leading to actual self-improvement (e.g., improved health behaviors, better work productivity, more prosocial acts, etc.).

***Increasing connectedness.*** Notably, gratitude leads people to feel closer and more connected to others (Wood et al., 2008), and this sense of connectedness may play a key role in motivating and sustaining self-improvement efforts. Past research has found that gratitude increases connectedness, which in turn promotes increases in well-being over time (Boehm et al., 2011). According to the find-remind-and-bind theory, gratitude leads people to recognize or acknowledge relationships with others, galvanizing them to engage in behaviors that bring them closer together (Algoe, 2012). Gratitude allows one to strengthen social bonds and friendships (Fredrickson, 2004) by promoting relationship connection and satisfaction (Algoe, Gable, & Maisel, 2010; Algoe, Haidt, & Gable, 2008), prompting people to manage interpersonal conflict constructively (Baron, 1984), and encouraging individuals to engage in better relationship maintenance behaviors (Bartlett, Condon, Cruz, Baumann, & DeSteno, 2012; Lambert & Fincham, 2011).

Feelings of connectedness may reinforce an individual's desire to be a good person and reach his full potential in other domains of his life. Social support—an important source of connectedness—is important to one's success in a variety of self-improvement endeavors, including weight loss (Wing & Jeffery, 1999), maintenance of New Year's resolutions (Norcross & Vangarelli, 1989), adherence to medical treatment (DiMatteo, 2004), and being a kinder person (Nelson et al., 2015). Feeling close and supported by other people may allow an individual to feel safe enough to take the chance of embarking on a self-improvement journey. Finally, connectedness can motivate self-improvement by increasing one's commitment to prove oneself worthy of the relationship with one's benefactor, by strengthening the desire to stay healthy and active, and by feeling encouraged and inspired by a role model. Gratitude may trigger increases in connectedness, which, in turn, may lead to increases in motivation and effort to embark on and sustain a range of self-improvement activities (see Figure 1).

***Increasing elevation.*** Elevation is associated with a warm feeling in the chest, a desire to help others and be a better person, and feeling moved, uplifted, and inspired to emulate the good deeds of others (Algoe & Haidt, 2009). Witnessing good deeds that promote the welfare of others has been found to elicit



**Figure 1.** Expressing gratitude promotes self-improvement via increased connectedness, elevation, and humility, as well as indebtedness, guilt, and discomfort.

the positive emotion of elevation (Haidt, 2003). Gratitude experiences often involve moral acts. Researchers have posited that gratitude acts as a moral barometer, thus making one aware of the moral acts around them, as well as those done on their behalf (McCullough et al., 2001). We hypothesize that gratitude will promote elevation, which in turn, will bolster motivation and effort towards other self-improvement goals. Indeed, individuals who feel elevated engage in more prosocial behavior (Landis et al., 2009), even relative to other positive emotions (Schnall, Roper, & Fessler, 2010; Vianello, Galliani, & Haidt, 2010).

**Increasing humility.** An important aspect of gratitude is the recognition that one has received a positive outcome that one did not necessarily earn (i.e., Emmons, 2004). This acknowledgement may humble a person and motivate her to prove that she deserves these benefits. As a malleable state, humility has been described not as a negative self-view, but as including the ability to accurately assess one's strengths and weaknesses, increased openness to critical feedback, and acknowledgement of the need for self-improvement (Chancellor & Lyubomirsky, 2013). Gratitude invokes themes of humility because one cannot simultaneously feel grateful for someone else's efforts and attribute successes completely to oneself. Like connectedness and elevation, humility may prompt individuals to engage in positive behaviors, such as helping others and bettering themselves, to pay back their benefactor's efforts. Indeed, research has successfully induced (and measured) state humility by prompting people to write gratitude letters (Kruse, Chancellor, Ruberton, & Lyubomirsky, 2014).

**Increasing specific negative states.** Thus far, we have argued that gratitude can lead to increased motivation and effort towards self-improvement via the positive emotional states it triggers. However, gratitude is not necessarily a purely positive emotion. By definition, gratitude is frequently experienced when one is in a subordinate social position—a role that may produce feelings of indebtedness, discomfort, and guilt. The act of acknowledging another's help can force an individual to recognize a weakness or need as they realize that their successes are not entirely their own. As such, an individual may feel obligated to repay her benefactor for help received, uncomfortable because she needed help in the first

place, and guilty for not reciprocating or thanking her benefactor sooner. We posit that the negative states triggered by expressing gratitude—particularly indebtedness and guilt—can be motivating. Two studies from our laboratory found that expressing gratitude led people to feel indebted and, in turn, to desire to be a better person and help others (Layous et al., 2016; see also Watkins, Scheer, Ovnicek, & Kolts, 2006). Although indebtedness does not make people feel happy (see Layous, Lee, Choi, & Lyubomirsky, 2013), it may mediate the link between gratitude and self-improvement motivation. Furthermore, guilt often arises in the context of social interactions and can motivate individuals to engage in relationship-enhancing behaviors (Baumeister, Stillwell, & Heatherton, 1994). Individuals may be more motivated to repay their benefactor for kindness received in order to reduce these negative feelings (Greenberg & Shapiro, 1971).

### *Empirical Support for the Gratitude and Self-Improvement Model*

Numerous studies have demonstrated the downstream benefits of positive activities (see Lyubomirsky & Layous, 2013, for a review). However, new research supports the idea that gratitude is a motivator of action, rather than a passive emotion. We recently obtained experimental evidence in undergraduates and working adults to support the effect of gratitude (relative to both neutral and positive controls) on connectedness, elevation, humility, indebtedness, guilt, and discomfort, as well as support for the link to self-improvement motivation.

First, we found evidence that expressing gratitude drives our hypothesized mediators (Layous et al., 2016). Two different manipulations of gratitude (recalling a past gratitude experience and writing a gratitude letter) induced more connectedness to others, feelings of elevation, and indebtedness than writing about a time in which one experienced two types of relief (positive emotion control conditions). Furthermore, undergraduates who recalled a time in which they felt grateful (i.e., wrote about a gratitude experience) reported feeling more moved, uplifted, and indebted than those prompted to recall a time in which they were kind or completed a neutral control activity. Notably, emotion diversity and cluster analyses confirmed that expressing gratitude leads

to the experience of both positive and negative emotions. First, emotion diversity analyses revealed that participants in the gratitude conditions were more likely to experience even proportions of positive and negative social emotions, including feeling moved, uplifted, and indebted, relative to those in the kindness or control conditions. Second, participants in the gratitude conditions were also relatively more likely to fall within a cluster representing above average levels of both positive and negative emotions. We argue that the negative emotions elicited by gratitude may motivate individuals to try to improve themselves in order to reduce these negative feelings.

Consistent with this notion, we found evidence that expressing gratitude leads participants to put forth more effort towards self-improvement. In a 3-week intervention, writing either a general gratitude letter or a gratitude letter for a specific kind act predicted greater self-reported effort toward becoming a kinder person than writing about neutral topics (Layous, Nelson, Kurtz, & Lyubomirsky, in press). We then explored the link between gratitude and self-improvement by prompting undergraduates either to write weekly gratitude letters or list their daily activities (control) for 6 weeks. All participants were also instructed to commit acts of kindness each week (i.e., to self-improve by becoming a kinder person). Participants who expressed gratitude reported relatively greater effort towards becoming a kinder person throughout the study via increased elevation, suggesting that elevation may be particularly motivating (Layous et al., in press).

Finally, in a 4-week intervention, corporate employees were prompted to write gratitude letters either to someone who did a kind act for them, who helped them with their health, or who helped them with their work. Immediately after expressing gratitude, participants reported experiencing higher elevation, humility, indebtedness, guilt, and marginally more discomfort and embarrassment relative to a neutral control group (Layous et al., 2016). Participants in the three experimental conditions were then instructed to try to improve themselves in kindness, health, or work, respectively, while participants in the control condition were instructed to focus on general self-improvement. Employees who expressed gratitude reported greater job performance, connectedness, autonomy, and empowerment at the end of the study via increased average elevation throughout the study (Armenta, Layous, Nelson, Chancellor, & Lyubomirsky, 2016). Expressing gratitude therefore appears to prompt individuals to feel elevated and inspired to be a better person, which then leads them to feel more productive at work, connected and close to others, free to make their own choices, and empowered in their work-life.

### **When Might Gratitude Backfire?**

Although expressing gratitude is expected to lead to a number of positive outcomes, including increased self-improvement, it is important to recognize that expressing gratitude may not always be beneficial. Gratitude may not lead to the expected positive outcomes—and may even decrease overall well-being—in certain individuals or in specific situations.

### *Insincere Gratitude*

Expressing gratitude is highly valued in society and, as such, an individual may feel compelled to express gratitude even when he does not necessarily feel thankful for kindness received. However, in order to obtain the rewards of gratitude, the expression of gratitude must be sincere or heartfelt. If an individual feels compelled to express gratitude and is only thanking his benefactor due to obligation or social pressure, he may not benefit from gratitude and may instead experience increases in negative emotions, such as annoyance or resentment (Layous & Lyubomirsky, 2014). Many people have likely learned over time that expressing gratitude is often well-received and can inspire the reciprocation of kind acts done on their behalf. However, if an individual only expresses gratitude in order to gain more favors, to appear more likeable, or to feel better about accepting kindness, then the gratitude might backfire (Watkins, 2014).

### *Depressed Individuals*

Expressing gratitude may also backfire for dysphoric individuals. In one study, expressing gratitude via writing gratitude letters led to diminished well-being in a mildly depressed population (Sin, Della Porta, & Lyubomirsky, 2011). It may be difficult for depressed individuals to think of situations in which people have helped them, concluding that they have nothing to be grateful for; they may feel disheartened if they don't feel the expected positive emotions when recalling these events; or they may feel overwhelmingly guilty for not having reciprocated or not having expressed gratitude sooner (e.g., Watkins, 2014).

### *Culture*

Although gratitude is widely valued, it may not lead to positive outcomes in all cultures. For example, in one study, South Koreans benefitted significantly less from expressing gratitude compared to U.S. participants (Layous et al., 2013; see also Boehm et al., 2011, for parallel results with Asian Americans). The authors hypothesized that this finding was due to cultural differences, suggesting that the experience of gratitude may vary by culture. Asians may be more prone to experiencing negative emotions, such as discomfort, guilt, and indebtedness as a result of expressing gratitude, and these negative feelings may offset the positive emotions that often accompany the experience of gratitude. Furthermore, expressing gratitude may not be as powerful in collectivist cultures, where it is more expected for people to help each other. In these cultures, expressing gratitude may feel out of character, or it may even offend the benefactor because it suggests that he or she actually considered the alternative of not helping.

### **Future Directions and Conclusions**

Although much of the research thus far has focused on the broader function of positive emotions (Fredrickson, 2001), new

evidence indicates that positive emotions—particularly gratitude—can motivate individuals to engage in specific positive behaviors (e.g., prosociality; McCullough et al., 2002). Theoretical and experimental evidence suggests that gratitude is not just a passive emotion, but rather one that can galvanize an individual to put forth more effort towards self-improvement via increases in connectedness, elevation, humility, and specific negative states (e.g., indebtedness). Although we believe that these specific mediators may be uniquely motivating for individuals, they fit into the broader categories of interpersonal relationships (i.e., connectedness), specific affect-relevant states (i.e., elevation, indebtedness, guilt, discomfort), and self-perceptions (i.e., humility). Hence, future investigators may wish to explore whether other aspects of these broader categories have the power to inspire and galvanize individuals to engage in positive behaviors. For example, experiencing awe may drive people to aspire to leave a permanent impact on the world in order to feel less small, and experiencing pride may foster increased effort to gain mastery of a skill in order to feel proud again (see Herral & Tomaka, 2002). The findings outlined in this article open up a new line of research focusing on discrete positive emotions as potential motivators, or triggers, of positive action.

Previous research has focused on gratitude as being purely positive. However, new evidence reveals that expressing gratitude leads to both positive and negative emotions. The resultant negative states may be particularly motivating in compelling individuals to engage in positive behaviors to reduce negative feelings. Future studies might explore the ways that negative feelings that accompany gratitude may uniquely boost motivation to engage in positive action. For example, after reflecting on how much a parent or mentor has supported them, lingering feelings of guilt or indebtedness—when not chronic or overwhelming—may light a fire of change and impel individuals to work harder or be better people. Although theory suggests that expressing gratitude should reduce general negative affect (e.g., frustration), we have not found specific evidence to support this notion. Therefore, future studies should test this potential mediator and explore whether a reduction in negative emotions can motivate individuals to engage in healthier, kinder, or more productive acts. Researchers could also explore whether different types of gratitude exercises, such as expressing gratitude to abstract entities or objects, vary in their effectiveness in motivating positive behaviors. For example, expressing gratitude towards an object is not likely to increase feelings of indebtedness and may not lead individuals to wish to improve themselves. In addition, researchers could explore whether other discrete positive emotions, such as pride and awe, are similarly characterized by both positive and negative emotions. For example, awe may lead people to feel fearful, insignificant, or anxious in addition to more connected with others (see Keltner & Haidt, 2003).

Future researchers may also wish to investigate the ideal situations in which to experience specific positive emotions, as well as the optimal levels of such emotions. There are times and places in which it is inappropriate to express certain positive

emotions (Wood et al., 2016). For example, expressing high levels of gratitude towards higher status others or in response to small kind acts, such as a stranger opening a door, is likely to be inappropriate or awkward. Expressing gratitude in these situations may lead people to feel uncomfortable and interfere with the formation and maintenance of an interpersonal relationship. However, for example, expressing a high level of gratitude in response to a large act may lead individuals to connect and form a tight social bond. The optimal levels of emotions and the optimal situations in which to express them also likely vary by culture. For example, members of Asian cultures may feel uncomfortable on the receiving end of high levels of gratitude because it is an integral part of the culture to help each other.

Positive emotions are far more than just fleeting, enjoyable experiences. They hold the potential to change the individual and her world. Experiencing positive emotions, such as gratitude, may motivate people to engage in positive behaviors that benefit their lives, the lives of the people around them, and the community at large.

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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