

Article

More than Merely Positive: The Immediate Affective and Motivational Consequences of Gratitude

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Abstract: Although gratitude is typically conceptualized as a positive emotion, it may also induce socially oriented negative feelings, such as indebtedness and guilt. Given its mixed emotional experience, we argue that gratitude motivates people to improve themselves in important life domains. Two single-timepoint studies tested the immediate emotional and motivational effects of expressing gratitude. We recruited employees ($n = 224$) from French companies in Study 1 and students ($n = 1026$) from U.S. high schools in Study 2. Participants in both studies were randomly assigned to either write gratitude letters to benefactors or outline their weekly activities (control condition). Expressing gratitude led to mixed emotional experiences (e.g., greater elevation and indebtedness) for employees and students as compared with the control group. Students also felt more motivated and capable of improving themselves, as well as conveyed stronger intentions to muster effort towards self-improvement endeavors.

Keywords: gratitude; emotion; motivation; self-improvement; well-being; positive activity intervention



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1. More than Merely Positive: The Immediate Affective and Motivational Consequences of Gratitude

Gratitude was likely a core societal theme long before philosophers, thinkers, leaders, and writers began to preach the importance of being thankful [1]. Today, children are taught to express gratitude at a young age, and people of all ages use social media to thank their benefactors. Nations across the world celebrate public holidays devoted to gratitude, including Erntedankfest in Germany, Pongal in India, and Thanksgiving in the USA [2]. Despite the omnipresence of gratitude in our past and present lives, psychological scientists have started studying gratitude relatively recently. Yet, gratitude research has multiplied in recent years [3].

Despite a proliferation of research linking gratitude to improved psychological well-being, physical health, and social relationships [4–7], relatively few studies have assessed the direct mixed emotional (i.e., both positive and negative) effects of gratitude immediately after it is practiced or expressed (for an exception, see [8]).

In addition to trying to replicate previous work on the downstream effect of gratitude on mixed emotions [8], the present work also aims to expand the gratitude literature by testing whether it can motivate self-improvement efforts. For example, working harder and eating healthier over time [9,10]. To the best of our knowledge, no research has tested whether people feel more motivated to improve themselves immediately after expressing gratitude. Thus, the present research aims to replicate and extend previous work by exploring gratitude's immediate affective and motivational consequences. Do the proximal effects of gratitude include positive experiences, negative experiences, and greater self-improvement motivation?

2. Definition of Gratitude

Gratitude has been defined as the quality or condition of being grateful or showing appreciation for kindness received [11]. It is derived from the Latin words *gratia* and *gratus*, meaning favor and pleasing, respectively [12]. Gratitude researchers have conceived gratitude in myriad ways—calling it an emotion, an attitude, a habit, a personality trait, and a moral virtue [13]. Yet, in the empirical psychological literature, the most commonly cited definition of gratitude describes it as a state requiring an individual to endorse that she has acquired a positive outcome from an external source [14].

Some researchers have further distinguished between two types of gratitude: (1) *generalized gratitude*, which involves appreciating various positive aspects of one's life; and (2) *benefit-triggered gratitude*, which is generally felt in response to receiving benefits from a benefactor [15]. The present studies focus on the second type of gratitude. Benefit-triggered gratitude tends to act as both a response to and motivator of moral behavior, nurturing social relationships by promoting reciprocal, prosocial behavior among beneficiaries, benefactors, and even strangers [16,17]. Past studies have shown that benefit-triggered gratitude interventions (i.e., gratitude letters) evoke immediate increases in positive emotions such as joy and happiness, as well as unpleasant experiences like indebtedness and guilt [8]. Such mixed experiences (especially indebtedness) may prompt people to want to improve themselves because they feel a need to repay the kindness of a benefactor or at least pay it forward to someone else [16,18,19]. Gratitude can also motivate indirect reciprocity [20]. The *find-remind-and-bind* theory suggests that gratitude's evolutionary function may have been to aid individuals in finding new (and reminding of current) relationship partners and binding to them [21].

3. Positive Consequences of Gratitude

Most research has focused on the positive outcomes of gratitude. According to the *broaden-and-build theory*, positive emotions, such as gratitude, may broaden people's thought-action repertoires, empowering them to build enduring resources for the future [22]. If this process repeats over time, positive emotions may trigger upward spirals of ever-increasing levels of well-being and resiliency [23].

To date, numerous studies have established the benefits of expressing gratitude for improved social relationships [6,24], physical health [5,10,14,25], and psychological well-being [7,26]. Further, two recent gratitude meta-analyses concluded that gratitude interventions outperformed measurement-only ($d = 0.20$), alternative activity ($d = 0.17$), and neutral control ($d = 0.18$) conditions in improving well-being [27,28]. Building on past research [8,29], we posit that writing a single gratitude letter may immediately engender the following positive outcomes: increased connectedness, elevation, humility, and positive affect, as well as decreased negative affect.

3.1. Connectedness

Connectedness refers to the extent to which people perceive that they have a significant, shared, and meaningful personal relationship with another person [30]. People are likely to feel more connected when they acknowledge that someone has gone out of their way to help them [31]. These feelings allow individuals to feel more connected with their benefactor and, consequently, promote relationship formation [32] and maintenance [6,20]. Evidence shows that feeling gratitude towards one's partner leads to increased connectedness and relationship satisfaction [24] and predicts being in more committed, longer-lasting relationships [33].

3.2. Elevation

Elevation is an emotion that occurs in response to observing morally virtuous behavior [34]. Witnessing acts of gratitude in the form of virtue or moral beauty, such as watching someone help a stranger, tends to provoke the positive emotion of elevation. Elevation is characterized by warm, open feelings in the chest (likely involving vagus

nerve activation) and a desire to be a better person [34,35]. It can be conceptualized as the opposite of (social) disgust. Thomas Jefferson thought of elevation as being elicited by acts of charity or gratitude [34]. Indeed, recent research has suggested that writing about grateful experiences may increase feelings of elevation relative to neutral controls [8].

Siegel, Thomson, and Navarro [36] examined whether elevation was distinct from gratitude. They randomly assigned participants to feel elevated or grateful. Afterward, they randomly assigned participants to have an opportunity to donate to charity (moral or amoral). Participants in the elevation condition focused on the charity's morality. Thus, the researchers concluded that elevation produced different behavioral responses than gratitude.

3.3. Humility

Humility is a social virtue with inter- and intra-personal aspects. Humility includes a focus on others' needs and well-being. In addition, it reflects an ability to see and hold an accurate and balanced self-view [37], reflected in an awareness of a person's own strengths and weaknesses [38]. Individuals with high humility tend to evaluate their strengths and weaknesses accurately, be open to critical feedback, and acknowledge room for self-improvement [39]. Gratitude is positively associated with humility [40], perhaps because humble people tend to show low self-focus [41] and are better able to recognize others' strengths and values—an essential component of gratitude [42]. In one study, participants either wrote a gratitude letter to someone who had been kind to them or completed a neutral control activity, and then responded to an open-ended anger prompt [41]. Participants who expressed gratitude prior to responding to the anger prompt had more humble responses, as determined by a group of coders.

3.4. Positive Affect

Although gratitude is itself a positive emotion [43], several studies have shown that gratitude letter interventions can induce higher levels of other positive emotions, such as happiness and enjoyment, relative to controls [8,27,28,44]. Pausing to acknowledge the goodness in the world and the fact that other people cared enough to help may elicit a surfeit of positive feelings. Moreover, people who frequently experience positive affect also tend to experience other desirable life outcomes, including superior health, interpersonal relationships, and career success [45,46].

3.5. Reduce General Negative Emotions

Finally, for various reasons, gratitude may also help undo several general negative emotions, such as anxiety, anger, frustration, and sadness. Gratitude promotes a positive reframing of negative situations by providing individuals with a sense of coherence [15]. Feeling grateful may reduce one's focus on losses and counteract the cognitive narrowing associated with various general negative emotions [15,47]. Research suggests gratitude may also be a powerful antidote for the physiological effects of negative emotions by increasing parasympathetic myocardial control [48] and decreasing systolic blood pressure [49].

4. Negative Consequences of Gratitude

Increase Specific Socially Oriented Negative Emotions

In line with previous work [8,29], however, we posit that gratitude letters may also immediately induce some specific socially oriented negative emotions, such as indebtedness, guilt, embarrassment, discomfort, and shame. Indebtedness is feeling obligated to repay another person [50], relying on the norm of reciprocity, which posits that people should help and should not damage those who have helped them [51]. Guilt is an emotional experience that comes after a personal or moral standard has been violated [52]. Embarrassment is an emotional reaction to an unintended or undesired social circumstance [53]. Discomfort is defined as a psychological or physiological uneasiness [54]. Finally, shame is a socially oriented negative emotion that stems from the perception that others perceive one's character, physical characteristics, or behaviors as unattractive and unwanted [55].

Such psychological states are typically experienced as unpleasant and aversive [17]. Acknowledging another's help may compel people to perceive that they are indebted to their benefactor(s), feel guilty for not repaying the debt, expose personal vulnerabilities or weaknesses, and/or reveal that they are uncomfortably dependent on others' good graces. Research from our laboratory suggests that expressing gratitude can make people feel indebted and guilty [8]. Importantly, gratitude and indebtedness are two distinct emotional states that coexist [56]. For example, in a study of couples, the thoughtful actions of one's partner predicted increases in both gratitude and indebtedness [24]. Feelings of indebtedness tend to increase with a feeling of a need to reciprocate. Thus, gratitude tends to decrease when people feel they need to pay their benefactor back.

5. Gratitude May Motivate Self-Improvement

Finally, we propose that gratitude may also motivate people to improve themselves (e.g., by working harder, eating healthier, and being kinder) [8,10,29]. Self-improvement is an individual's attempt to learn how to improve on a specific attribute [57]. Similar to other positive emotions (e.g., happiness and pride), gratitude may spur people to broaden their cognitions (prompting urges to play, explore, achieve, etc.) and build enduring resources (e.g., stronger personal relationships, useful skills) for the future [43]. However, gratitude may be especially and uniquely motivating, prompting the urge to behave prosocially, which in turn spurs a wide range of actions aimed at benefitting others. Writing a gratitude letter often involves reflecting on a benefactor's investment of time and/or resources, which may prompt individuals to try to be worthy of this investment. One way they might become worthy involves improving themselves. Further, theory and research suggest that gratitude may encourage individuals to put forth more effort towards positive change. Gratitude has generally been regarded as motivating and energizing [58–60]. Thus, gratitude may not only prompt people to pay kindness back to benefactors but also inspire them to pay it forward to others [16,18,19]. Researchers have speculated that gratitude could strengthen one's resources for coping with a challenge [61], decrease self-destructive behaviors, and increase personally beneficial behaviors [17], all of which could be important for self-improvement endeavors. Furthermore, preliminary evidence indicates that gratitude may catalyze people to work towards important life goals [58], such as eating more healthfully [10]. Gratitude may lead people to believe that they deserve positive outcomes for themselves and that they are capable of obtaining those outcomes [15]. The positive outcomes they achieve for themselves (e.g., becoming kinder or wiser) may also help other people.

In summary, we hypothesized that expressing gratitude would immediately lead to both positive and negative consequences (i.e., a mixed emotional experience), as well as elicit greater intended effort and self-improvement motivation.

6. The Current Studies

We conducted two single-time points experiments: the first experiment with adult employees of French companies and the second experiment with adolescents from U.S. high schools. In both studies, participants were randomly assigned to write gratitude letters either to someone who did a kind act for them (both studies), to someone who helped them with their health (both studies), or to someone who helped them with their work (Study 1) or academics (Study 2). Participants in the control conditions in both studies wrote an emotionally neutral outline of their weekly activities (i.e., listing what they did during the past week), which is a common alternative activity control that has frequently been deployed in numerous gratitude letter studies [27].

We expected gratitude to prompt people to rapidly feel connected to others, inspired to emulate good deeds, humbled enough to improve themselves, and socially obligated to do so—all while boosting positive emotions to spur positive change and defusing some negative emotions that may serve as obstacles to such change. To unpack effects further, we also assigned participants to three specific gratitude conditions (gratitude towards someone who helped with a general kindness, gratitude towards someone who helped with health, and

gratitude towards someone who helped with work/academics) because these represent the major areas of people's lives, and we sought to explore potential differences among them.

We did not preregister our hypotheses for these studies because they were conducted before our lab began preregistering all our studies. However, data, materials and R code are available at <https://osf.io/e2sbn>. We report all manipulations, measures, and exclusions in these studies. This research received ethical approval from the Institutional Review Board at the University of California, Riverside.

7. Study 1

Numerous studies have demonstrated the downstream benefits of gratitude interventions, as described above. However, new research supports the idea that gratitude is not just a passive “feel-good” emotion but rather one that may also induce negative states [8]. In Study 1, we aimed to investigate the immediate emotional and motivational effects of expressing gratitude relative to neutral control activity. To this end, corporate employees wrote letters of gratitude to someone who had helped them in one of three different ways: specifically, vis-à-vis (a) general kindness, (b) health, or (c) work. Participants in the control condition wrote about what they had done over the last seven days.

We predicted that participants in the gratitude conditions would report higher levels of gratitude, connectedness, elevation, humility, and improvement motivation, as well as lower levels of general negative affect (e.g., anger and frustration) relative to controls. We also hypothesized that expressing gratitude may give rise to specific negative socially oriented emotions such as feelings of indebtedness, guilt, embarrassment, shame, and discomfort.

7.1. Method

7.1.1. Participants

Employees from four French companies and one French-Canadian company completed Study 1 online ($N = 224$, 71.4% female, $M_{age} = 37.17$, $SD = 9.08$). Most participants had completed college (46.4%), with 21.0% of participants having completed graduate school, 20.5% having completed some college, 7.1% having completed high school, and 4.9% of participants having not completed high school. Information about ethnicity was not collected due to regulations from the Commission Nationale Informatiques et Libertés (CNIL). We aimed to recruit 100 participants per condition [62]. However, our sample was composed of busy working adults who are notoriously difficult to enlist, and we could not reach this target. Thus, we recruited as many participants as possible until the available subject pool was exhausted [63]. No participants were excluded, and we did not conduct analyses until the final sample size was collected. We performed a sensitivity power analysis using GPower [64]. Because we had a directional a priori hypothesis, we used a one-tailed test. The power analysis indicated that the smallest effect size that this sample could detect with 80% power was Cohen's $d = 0.38$ (equivalent to Cohen's $f = 0.19$). The study was translated into French by a professional translation service (Gengo), and then reviewed by several native French speakers who made minor adjustments.

7.1.2. Procedure

Participants volunteered to participate in a 6-week online study ostensibly about “the relationship between positive activities, positive experiences, and emotion.” However, because the current hypotheses focus on the effects of gratitude immediately after it is expressed, the analyses presented here focus only on Week 1.

Participants were directed to a password-protected website via an internal email sent to all employees. When they logged in to the website, we randomly assigned them to spend 8 min writing a gratitude letter either to (a) someone who had performed a kind act for them ($n = 55$), (b) to someone who had done something to help them with their health ($n = 56$), or (c) to someone who had done something to help them with their work ($n = 59$). Participants were prompted to address the letter to a specific individual for whom they were grateful, to describe the actions of the individual and how it has affected them, and to

explain how often they think about the individual's actions. They were directed to express their gratitude without intent to deliver the letter to anyone, as is common in numerous gratitude letter interventions [27]. Research shows that merely writing gratitude letters can prompt similar effects as directly sharing gratitude with benefactors ($r_s = 0.15$ vs. 0.19 [65]).

Participants in the control group ($n = 54$) were prompted to spend 8 min writing a detailed list of the activities they did over the past seven days. They were asked to focus on their actions rather than their emotions, feelings, or opinions. See Supplementary Materials for condition instructions.

All participants then completed our outcome measures to assess the immediate effects of expressing gratitude. After completing the outcomes and before participants logged off, as part of the longer 6-week study, they received instructions to spend 30 min during the upcoming week trying to improve themselves either in kindness, health, academics, or a generally positive change (control condition). At later time points, participants reported on their self-improvement efforts, but these data are beyond the scope of the present investigation (see [8] for an investigation of gratitude's longer-term consequences on self-improvement).

7.1.3. Measures

After completing their assigned writing activity (gratitude or control), we asked participants to complete the following measures:

State Gratitude To gauge how grateful participants felt, they completed a state version of the Gratitude Questionnaire–Six Item Form [31] (e.g., “Right now, I feel I have much in life to be thankful for,” from 1 = *strongly disagree* to 7 = *strongly agree*, $\alpha = 0.87$).

Connectedness To assess the degree to which they felt connected to others, participants completed the relatedness subscale of the Balanced Measure of Psychological Needs [66], which includes three positively scored items (e.g., “I had a strong sense of intimacy with the people I spent time with”) and three reverse-scored items (e.g., “I felt lonely”, from 1 = *no agreement* to 5 = *much agreement*, $\alpha = 0.66$).

Elevation “Elevation” is not a widely familiar archetypal emotion such as anger or happiness [67]. Haidt [68] defined elevation as a specific type of positive emotion (the opposite of social disgust) that is prompted by witnessing another person perform a virtuous act, especially one that benefits others. To assess elevation, we used a previously validated six-item measure [35] that asked participants to rate the following specific feelings and cognitive appraisals associated with elevation (as discussed by [34]): moved, uplifted, optimistic about humanity, a warm feeling in your chest, a desire to become a better person, and a desire to help others (from 1 = *don't feel at all* to 7 = *feel very strongly*, $\alpha = 0.85$).

Humility Participants rated the extent to which they felt humble using the six-item Brief State Humility Scale (BSHS) [39]. Participants indicated their agreement with three high humility items (e.g., “I feel that I have both many strengths and faults”) and three low humility items (e.g., “To be completely honest, I feel that I am better than most people”, reverse-coded) on a 7-point scale (from 1 = *strongly disagree* to 7 = *strongly agree*, $\alpha = 0.57$).

General Negative Affect To assess the extent to which participants felt general negative emotions such as anxiety, anger, and fear, we asked them to complete a modified version of the Affect-Adjective Scale [8,69] that included only the negative emotion items. Participants were asked to rate their feelings on each of the five items using a 7-point scale (from 1 = *not at all* to 7 = *extremely*, $\alpha = 0.89$).

Specific Socially Oriented Negative Emotions (Indebtedness, Guilt, Embarrassment, Discomfort, and Shame) Participants also completed five single-item measures of indebtedness (feeling the need to repay another), guilt, embarrassment, and shame as part of our modified Affect-Adjective Scale [8,69]. Once again, participants were asked to rate the extent to which they felt these emotions on a 7-point scale (from 1 = *not at all* to 7 = *extremely*).

Improvement Motivation Depending on their assigned condition, employees rated four items to indicate the extent to which they felt motivated, competent, and confident in their ability to improve themselves in kindness, health, work, or in general, as well as how

much they believed that simple activities could help them improve themselves in these areas, on a 7-point scale (from 1 = *not at all* to 7 = *very much*, $\alpha = 0.79$).

Additional Measures Because the Week 1 assessment was part of a longer 6-week study, there were some other measures that were not analyzed for the present investigation. See Supplementary Materials for additional measures not reported here.

7.2. Results

To test our hypotheses, we performed four planned contrasts for each of our key variables, comparing the gratitude condition(s) to the control condition. In the first planned contrast, we compared all three gratitude groups (gratitude towards kindness, health, and work) to the control group. In the second planned contrast, we subset the data to compare the gratitude towards the kindness group to the control condition—excluding the gratitude towards health and work groups. Third, we compared the gratitude towards the health group to the control group, setting aside the other two gratitude conditions. Finally, in the fourth planned contrast, we compared the gratitude towards work group to the control group, excluding the other two gratitude conditions. See Table 1 for condition means and standard deviations and Table 2 for correlations between outcome variables.

Table 1. Condition means and standard deviations for Study 1.

Variable	Gratitude towards Kindness		Gratitude towards Health		Gratitude towards Work		Control	
	M (SD)	n	M (SD)	n	M (SD)	n	M (SD)	n
Gratitude	5.13 (1.19)	52	4.69 (1.25)	53	4.51 (1.26)	57	4.61 (1.21)	49
Connectedness	3.79 (0.67)	52	3.86 (0.72)	53	3.70 (0.65)	57	3.86 (0.77)	50
Elevation	5.06 (1.16)	48	4.32 (1.52)	46	4.31 (1.34)	53	3.47 (1.48)	46
Humility	5.34 (0.71)	50	5.30 (1.03)	51	5.44 (1.06)	56	5.11 (0.87)	49
Negative affect	2.21 (1.22)	50	2.26 (1.43)	52	1.94 (1.10)	56	1.98 (1.32)	50
Indebtedness	4.81 (1.97)	47	3.75 (2.10)	48	4.23 (1.77)	53	2.50 (1.76)	46
Guilt	2.30 (1.49)	47	2.20 (1.71)	46	1.89 (1.44)	53	1.46 (1.00)	46
Embarrassment	1.60 (1.09)	50	1.58 (1.21)	52	1.46 (1.08)	56	1.28 (0.83)	50
Discomfort	2.04 (1.50)	49	2.21 (1.64)	52	1.82 (1.21)	56	1.62 (1.31)	50
Shame	3.06 (1.57)	49	2.81 (1.84)	52	2.50 (1.65)	55	2.62 (1.85)	49
Improvement Motivation	5.76 (0.89)	54	5.38 (1.06)	54	5.70 (0.75)	59	5.78 (0.65)	52

Table 2. Correlations for Study 1.

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Gratitude	–										
2. Connectedness	0.27 ***	–									
3. Elevation	0.38 ***	0.10	–								
4. Humility	0.11	0.13 †	–0.04	–							
5. Negative affect	–0.29 ***	–0.46 ***	–0.04	–0.12 †	–						
6. Indebtedness	0.23 **	–0.04	0.53 ***	–0.06	–0.01	–					
7. Guilt	0.03	–0.25 ***	0.12 †	–0.06	0.40 ***	0.25 ***	–				
8. Embarrassment	–0.06	–0.21 **	0.11	–0.07	0.39 ***	0.14 †	0.51 ***	–			
9. Discomfort	–0.19 **	–0.44 ***	–0.07	–0.06	0.69 ***	0	0.49 ***	0.54 ***	–		
10. Shame	–0.07	–0.23 **	0.05	–0.06	0.43 ***	0.08	0.49 ***	0.74 ***	0.58 ***	–	
11. Improvement Motivation	0.25 ***	0.20 **	0.19 **	0.03	–0.26 ***	0.12 †	–0.11	–0.14 *	–0.30 ***	–0.17 *	–

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

7.2.1. All Gratitude Conditions vs. Control

As hypothesized, participants in the three gratitude conditions, relative to participants who listed their weekly activities in the control condition, reported significantly higher levels of elevation ($t[189] = 4.71$, $p < 0.001$); humility ($t[202] = 1.68$, $p = 0.07$); indebtedness ($t[190] = 5.49$, $p < 0.001$); guilt ($t[188] = 2.77$, $p = 0.03$); as well as marginally greater embarrassment ($t[204] = 1.55$, $p = 0.06$) and discomfort ($t[203] = 1.48$, $p = 0.07$). No significant differences emerged between the three gratitude conditions and the control condition for

gratitude ($t[220] = 0.85, p = 0.20$); connectedness ($t[208] = -0.64, p = 0.26$); negative affect ($t[204] = -0.78, p = 0.22$); shame ($t[201] = 0.47, p = 0.32$); and improvement motivation ($t[215] = -1.18, p = 0.12$) (all p -values are based on one-sided tests).

7.2.2. Gratitude towards Kindness vs. Control

To unpack the above findings, we compared the gratitude towards kindness group to the control group. As predicted, participants who expressed gratitude towards a person who did a kind act for them reported significantly higher levels of gratitude ($t[99] = 2.12, p = 0.02$); elevation ($t[92] = 5.59, p < 0.001$); indebtedness ($t[91] = 5.84, p < 0.001$); and guilt ($t[98] = 2.83, p = 0.003$). They also reported marginally higher levels of humility ($t[97] = 1.27, p = 0.10$); embarrassment ($t[98] = 1.50, p = 0.07$); and discomfort ($t[98] = 1.54, p = 0.06$). Counter to our prediction, relative to controls, participants in the gratitude toward kindness condition did not report significantly different levels of connectedness ($t[100] = -0.49, p = 0.31$); negative affect ($t[98] = -0.91, p = 0.18$); shame ($t[95] = 0.36, p = 0.36$); or improvement motivation ($t[104] = -0.07, p = 0.47$).

7.2.3. Gratitude towards Health vs. Control

Participants who expressed gratitude towards help with their health reported greater elevation ($t[90] = 2.98, p = 0.002$); indebtedness ($t[92] = 3.18, p = 0.001$); guilt ($t[100] = 2.47, p = 0.008$); and discomfort ($t[100] = 2.11, p = 0.02$); as well as marginally higher levels of embarrassment ($t[100] = 1.41, p = 0.08$) than those in the control group. They also showed significantly lower improvement motivation ($t[104] = -2.36, p = 0.01$), relative to controls. We found no significant differences concerning gratitude ($t[100] = 0.35, p = 0.36$); connectedness ($t[101] = 0.04, p = 0.48$); humility ($t[104] = 0.98, p = 0.16$); negative affect ($t[100] = -1.15, p = 0.13$); and shame ($t[99] = 1.06, p = 0.16$).

7.2.4. Gratitude towards Work vs. Control

Finally, in support of our hypotheses, participants who expressed gratitude towards someone who helped with their work reported significantly higher levels of elevation ($t[97] = 3.04, p = 0.001$); humility ($t[103] = 1.84, p = 0.03$); and indebtedness ($t[97] = 4.50, p < 0.001$) than participants in the control condition. They also reported feeling marginally more guilty ($t[104] = 1.49, p = 0.07$). Counter to our prediction, the participants in the gratitude towards work condition did not differ in their levels of gratitude ($t[104] = -0.39, p = 0.35$); connectedness ($t[105] = -1.14, p = 0.13$); negative affect ($t[104] = 0.17, p = 0.43$); embarrassment ($t[104] = 0.89, p = 0.19$); discomfort ($t[104] = 0.73, p = 0.23$); shame ($t[102] = -0.26, p = 0.40$); or improvement motivation ($t[109] = -0.47, p = 0.32$) than the control group.

7.3. Discussion

The results of Study 1 provide further evidence that expressing gratitude produces a mixed emotional experience. Surprisingly, only participants in the gratitude towards kindness condition reported feeling more grateful relative to participants in the control condition. However, we found relatively consistent results, suggesting that expressing gratitude led to greater elevation, humility, and indebtedness, and some support for guilt, embarrassment, and discomfort. We did not find support in this sample of French employees for our hypotheses regarding connectedness, negative affect, shame, and improvement motivation. Moreover, participants in the gratitude towards health condition reported significantly lower motivation to improve than those in the control condition.

8. Study 2

The aim of Study 2 was to increase generalizability and external validity by testing our research hypotheses in a much larger and very different sample from Study 1. In addition to further investigating the immediate, mixed emotional effects of expressing gratitude, we sought to examine the effects on self-improvement striving with new measures (e.g., intended effort and intrinsic motivation). We recruited high school students from the USA

and randomly assigned them to write either a letter of gratitude to someone who had helped them (with general kindness, health, or academics) or to write about what they did over the last seven days (the neutral control comparison).

As in Study 1, we predicted that high school students who wrote gratitude letters would immediately report greater levels of gratitude, connectedness, elevation, humility, indebtedness, general positive affect (e.g., happiness and joy), and specific socially oriented negative emotions (e.g., guilt and embarrassment), as well as greater reductions in general negative affect (e.g., anger and frustration) than those who listed their daily activities (i.e., controls). We also expected that, relative to controls, students who wrote gratitude letters would feel more motivated and capable of improving themselves and would express greater intentions to put forth effort towards self-improvement.

8.1. Method

8.1.1. Participants

We recruited 9th and 10th grade students ($N = 1026$, 50.3% female, $M_{age} = 15.17$, $SD = 0.73$). Participants were mostly White (43.3%), Hispanic (19.4%), Asian (15.4%), and Black (4.3%), with 1.7% describing themselves as Native American or Pacific Islander. Further, 12.8% of the participants identified as “more than one” ethnicity, and 3.1% identified as “other.” As in Study 1, we aimed to recruit 100 participants per condition [62]. Fortunately, we were able to recruit a much larger sample than originally expected. No participants were excluded, and we did not conduct analyses until the final sample size was collected. A sensitivity power analysis using GPower [64], assuming a one-tailed test, indicated that the smallest effect size that this sample could detect with 80% power was $d = 0.18$ (equivalent to Cohen’s $f = 0.09$). Students were recruited from four different U.S. high schools. Three schools were based in the Los Angeles area, and one school was located in New York City. Two schools were independent, and two schools were public. The students came from a range of low to high-income families. In exchange for their participation, students received USD 3 compensation.

8.1.2. Design and Procedure

We conducted Study 2 as part of a larger 4-week longitudinal project aimed at triggering self-improvement in adolescents. Students participated in a study ostensibly about “the relationship between positive activities, positive experiences, and emotion in teenagers.” As in Study 1, because the present hypotheses focus on the proximal effects of expressing gratitude, the analyses presented here focus only on the first timepoint.

Each school sent students home with a consent form explaining the study, asking parents to provide consent for their child to participate. Teachers introduced the study to students, accompanied them to a computer lab (if needed), and instructed them to log in to the study. Upon logging in, students assented to participate in the study. Some schools provided tablets or computers for students to use to complete the study in class. Students were prompted to start the study during the second semester of their academic school year.

Paralleling the design of Study 1, students were randomly assigned to write a letter of gratitude to someone who either did something kind for them ($n = 260$), helped them with their health ($n = 262$), or helped them with their academics ($n = 257$). To strengthen the larger longitudinal gratitude project, students also read testimonials from a hypothetical same-aged peer about feeling connected and indebted and writing about their benefactor’s intentions, costs, and benefits. These additional activities were expected to reinforce the gratitude exercise by allowing students to reflect more deeply on the people who helped them and their emotions while writing the gratitude letters (see [44] for theory and evidence supporting this approach). Those in the control condition ($n = 247$) were prompted to list what they did the previous week and focus on becoming more organized. See Supplementary Materials for conditions and additional activity instructions.

After logging in to the online survey and providing consent, students completed some demographics and initial measures. Next, students in the gratitude conditions read a

testimonial from a hypothetical same-aged peer about how expressing gratitude made them feel connected and indebted. Then, they spent 5 min working on their assigned gratitude writing activity. After writing a gratitude letter, students in the gratitude conditions were prompted to write more about the benefits they received and their benefactors' intentions and costs. Students in the control condition read a testimonial about the importance of organization and wrote about the benefits and obstacles of becoming more organized. They then wrote about what they had done over the past seven days.

Then, all students completed our key set of measures (e.g., gratitude, elevation, and intended effort) and received instructions to spend 30 min during the upcoming week trying to improve themselves either in kindness, health, academics, or organization (control condition). We then asked students to complete measures of motivation and intended effort. The remainder of the study procedure (including additional time points) is described elsewhere [9,10].

8.1.3. Measures

Students completed the same measures as in Study 1 for state gratitude ($\alpha = 0.80$), connectedness ($\alpha = 0.64$), elevation ($\alpha = 0.88$), humility ($\alpha = 0.53$), general negative affect (e.g., anger and frustration, $\alpha = 0.84$), and single-item socially oriented negative emotions (e.g., indebtedness and guilt). The following measures were additionally collected in Study 2:

Positive Affect To assess positive emotions such as happiness and joy, we used a modified Affect-Adjective Scale [69]. Participants indicated the extent to which they felt four positive emotions on a 7-point scale (from 1 = *not at all* to 7 = *extremely*, $\alpha = 0.91$).

Improvement Motivation (Competence, Confidence, Efficacy, and General Motivation) Similar to Study 1, participants completed four items to indicate the extent to which they wanted to improve themselves in kindness, health, work, or in general. On a 7-point scale (from 1 = *not at all* to 7 = *very much*), they rated the extent to which they felt competent to improve themselves, confident in their abilities, believed that simple activities could spur improvement (i.e., efficacy), and their general motivation. We report results for each item separately, as well as combined ($\alpha = 0.90$).

Intended Effort We also asked participants to indicate how much effort they intended to put into completing their assigned weekly activity (from 1 = *no effort* to 7 = *a great deal of effort*), as well as how hard they intended to try (from 1 = *not hard at all* to 7 = *very hard*). The two items were averaged to form a composite ($\alpha = 0.90$).

Self-Concordant Motivation (Intrinsic, Extrinsic, Introjected, and Identified Motivation) Participants rated the extent to which they generally pursued self-improvement in their assigned domain with four single items, specifically, for the fun and enjoyment it provided them (i.e., intrinsic motivation), because others demanded it (i.e., extrinsic motivation), due to shame, guilt, or anxiety (i.e., introjected motivation), or because they believed it was an important goal (i.e., identified motivation) [70] on a 7-point scale (from 1 = *not at all* to 7 = *very much*). We report each item separately in the results.

Additional Measures Again, because the first timepoint of Study 2 was part of a larger, longitudinal study, some other measures (see Supplementary Materials) were not analyzed for the present investigation.

8.2. Results

To explore the immediate emotional and motivational impact of expressing gratitude, we performed the same set of four planned contrasts as in Study 1. See Tables 3 and 4 for Study 2 condition means and standard deviations, and variable correlations.

8.2.1. All Gratitude Conditions vs. Control

As hypothesized, high school students in the three gratitude conditions reported higher levels of state gratitude ($t[960] = 2.80$, $p = 0.003$); connectedness ($t[947] = 5.98$, $p < 0.001$); elevation ($t[952] = 9.42$, $p < 0.001$); indebtedness ($t[949] = 9.91$, $p < 0.001$); positive affect ($t[956] = 2.89$, $p = 0.002$); improvement motivation ($t[928] = 2.60$, $p = 0.005$); intended

effort ($t[933] = 8.45, p < 0.001$); intrinsic motivation ($t[921] = 2.19, p = 0.01$); introjected motivation ($t[922] = 2.02, p = 0.02$); and identified motivation ($t[922] = 5.56, p < 0.001$), as well as less general negative affect ($t[956] = -2.26, p = 0.01$), relative to those who listed their daily activities in the control group. However, students who expressed gratitude did not report significantly different amounts of humility ($t[942] = 0.61, p = 0.27$); guilt ($t[950] = 0.88, p = 0.19$); embarrassment ($t[955] = -0.61, p = 0.27$); shame ($t[956] = -0.71, p = 0.24$); discomfort ($t[956] = 0.09, p = 0.46$); or extrinsic motivation ($t[923] = -1.06, p = 0.14$) than those who listed their daily activities.

Table 3. Condition means and standard Deviations for Study 2.

Variable	Gratitude towards Kindness		Gratitude towards Health		Gratitude towards Academics		Control	
	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>
Gratitude	5.84 (0.91)	245	5.60 (1.10)	251	5.65 (1.06)	236	5.47 (1.14)	232
Connectedness	3.84 (0.68)	242	3.86 (0.73)	247	3.85 (0.74)	232	3.53 (0.67)	230
Elevation	4.65 (1.35)	243	4.62 (1.42)	248	4.50 (1.52)	235	3.56 (1.49)	230
Humility	5.13 (0.98)	242	5.10 (0.97)	243	5.21 (0.98)	232	5.10 (0.94)	229
Indebtedness	4.55 (1.95)	242	4.57 (2.09)	246	4.37 (2.01)	235	3.02 (1.81)	230
Guilt	2.31 (1.77)	242	2.43 (1.77)	247	2.32 (1.62)	235	2.24 (1.61)	230
Embarrassment	1.85 (1.48)	243	1.81 (1.37)	250	1.92 (1.43)	236	1.92 (1.34)	230
Shame	1.84 (1.53)	244	1.74 (1.31)	250	1.78 (1.32)	236	1.86 (1.38)	230
Discomfort	2.18 (1.60)	244	2.09 (1.47)	250	2.11 (1.38)	236	2.12 (1.30)	230
Positive affect	4.68 (1.31)	244	4.59 (1.44)	250	4.62 (1.42)	236	4.34 (1.46)	230
Negative affect	2.54 (1.25)	244	2.49 (1.15)	250	2.54 (1.21)	236	2.73 (1.23)	230
Improvement motivation	5.58 (1.08)	239	5.35 (1.07)	243	5.43 (1.19)	227	5.23 (1.19)	223
Competence	5.35 (1.31)	239	5.21 (1.35)	242	5.50 (1.41)	226	5.18 (1.35)	223
Confidence	5.64 (1.39)	239	5.42 (1.42)	243	5.46 (1.60)	227	5.11 (1.55)	223
Efficacy	5.68 (1.44)	239	5.45 (1.43)	243	5.18 (1.55)	227	5.24 (1.56)	223
General motivation	5.65 (1.29)	239	5.31 (1.41)	243	5.56 (1.37)	227	5.36 (1.44)	223
Intended effort	5.64 (1.17)	241	5.21 (1.37)	243	5.86 (1.28)	228	4.69 (1.49)	225
Intrinsic motivation	5.28 (1.50)	239	4.77 (1.83)	240	3.88 (1.97)	226	4.35 (1.87)	220
Extrinsic motivation	4.08 (1.85)	239	3.87 (1.94)	241	4.50 (1.91)	226	4.30 (1.86)	221
Introjected motivation	4.20 (1.97)	239	3.80 (2.04)	241	4.89 (1.90)	226	3.97 (1.98)	220
Identified motivation	5.81 (1.26)	239	5.70 (1.51)	240	5.86 (1.47)	226	5.15 (1.68)	221

8.2.2. Gratitude towards Kindness vs. Control

As predicted, students who expressed gratitude towards someone who did something kind for them reported higher levels of state gratitude ($t[475] = 3.75, p < 0.001$); elevation ($t[471] = 8.16, p < 0.001$); connectedness ($t[470] = 4.76, p < 0.001$); indebtedness ($t[470] = 8.40, p < 0.001$); elevation ($t[471] = 8.16, p < 0.001$); positive affect ($t[472] = 2.66, p = 0.004$); improvement motivation ($t[336] = 4.70, p < 0.001$); intended effort ($t[464] = 7.68, p < 0.001$); intrinsic motivation ($t[457] = 5.60, p < 0.001$); and identified motivation ($t[458] = 4.76, p < 0.001$), as well as less general negative affect ($t[471] = -1.74, p < 0.001$). Relative to controls, however, participants who expressed gratitude towards kindness did not differ in their levels of humility ($t[469] = 0.35, p = 0.36$); guilt ($t[470] = 0.45, p = 0.33$); embarrassment ($t[471] = -0.54, p = 0.29$); shame ($t[472] = -0.19, p = 0.42$); discomfort ($t[472] = 0.44, p = 0.33$); extrinsic motivation ($t[458] = -1.27, p = 0.102$); or introjected motivation ($t[457] = 1.24, p = 0.11$).

Table 4. Correlations for Study 2.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1. Gratitude	–																					
2. Connectedness	0.60 ***	–																				
3. Elevation	0.44 ***	0.47 ***	–																			
4. Humility	0.14 ***	0.13 ***	0.09 **	–																		
5. Indebtedness	0.19 ***	0.21 ***	0.55 ***	0.10 **	–																	
6. Guilt	–0.17 ***	–0.25 ***	0.14 ***	–0.05 †	0.27 ***	–																
7. Embarrassment	–0.20 ***	–0.30 ***	0.05 †	–0.06 *	0.11 ***	0.36 ***	–															
8. Shame	–0.29 ***	–0.39 ***	–0.01	–0.06 *	0.12 ***	0.46 ***	0.63 ***	–														
9. Discomfort	–0.28 ***	–0.37 ***	–0.04	–0.05	0.10 **	0.33 ***	0.62 ***	0.60 ***	–													
10. Positive affect	0.56 ***	0.57 ***	0.48 ***	–0.01	0.19 ***	–0.12 ***	–0.11 ***	–0.28 ***	–0.25 ***	–												
11. Negative affect	–0.45 ***	–0.55 ***	–0.18 ***	–0.07 *	0.02	0.35 ***	0.50 ***	0.60 ***	0.56 ***	–0.46 ***	–											
12. Improvement Motivation	0.49 ***	0.40 ***	0.40 ***	0.06 †	0.17 ***	–0.12 ***	–0.09 **	–0.19 ***	–0.18 ***	0.47 ***	–0.24 ***	–										
13. Competence	0.39 ***	0.30 ***	0.28 ***	0.00	0.09 **	–0.11**	–0.05	–0.15 ***	–0.14 ***	0.38 ***	–0.17 ***	0.83 ***	–									
14. Confidence	0.43 ***	0.38 ***	0.31 ***	–0.05	0.09 **	–0.20 ***	–0.15 ***	–0.24 ***	–0.21 ***	0.45 ***	–0.27 ***	0.81 ***	0.65 ***	–								
15. Efficacy	0.37 ***	0.32 ***	0.31 ***	0.16 ***	0.18 ***	–0.03	–0.09 **	–0.13 ***	–0.12 ***	0.31 ***	–0.18 ***	0.75 ***	0.44 ***	0.41 ***	–							
16. General Motivation	0.36 ***	0.28 ***	0.37 ***	0.09 **	0.18 ***	–0.04	0.02	–0.06 †	–0.09**	0.36 ***	–0.12 ***	0.79 ***	0.56 ***	0.49 ***	0.49 ***	–						
17. Intended Effort	0.34 ***	0.30 ***	0.44 ***	0.13 ***	0.26 ***	–0.01	0.02	–0.05	–0.06 †	0.32 ***	–0.10 **	0.58 ***	0.45 ***	0.39 ***	0.37 ***	0.62 ***	–					
18. Intrinsic Motivation	0.26 ***	0.19 ***	0.32 ***	–0.03	0.10 **	–0.01	0.00	–0.05	–0.09 **	0.34 ***	–0.12 ***	0.48 ***	0.36 ***	0.38 ***	0.36 ***	0.42 ***	0.38 ***	–				
19. Extrinsic Motivation	–0.05	–0.09 **	–0.03	–0.09 **	0.02	0.07 *	0.08 *	0.05	0.08 *	0.00	0.16 ***	–0.04	0.00	–0.04	–0.06 †	–0.04	0.01	–0.06 †	–			
20. Introjected Motivation	–0.05	–0.16 ***	0.03	0.05	0.11 ***	0.18 ***	0.20 ***	0.22 ***	0.20 ***	–0.10 **	0.27 ***	–0.01	0.02	–0.09**	–0.02	0.07 *	0.14 ***	0.01	0.38 ***	–		
21. Identified Motivation	0.36 ***	0.30 ***	0.32 ***	0.13 ***	0.19 ***	–0.02	–0.04	–0.07 *	–0.10 **	0.28 ***	–0.15 ***	0.55 ***	0.43 ***	0.41 ***	0.38 ***	0.53 ***	0.52 ***	0.45 ***	–0.03	0.12 ***	–	

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

8.2.3. Gratitude towards Health vs. Control

As expected, participants who expressed gratitude towards someone who helped them with their health felt relatively greater connectedness ($t[475] = 5.10, p < 0.001$); elevation ($t[476] = 8.03, p < 0.001$); indebtedness ($t[474] = 8.57, p < 0.001$); intended effort ($t[466] = 4.23, p < 0.001$); intrinsic motivation ($t[458] = 2.54, p = 0.006$); identified motivation ($t[459] = 3.95, p < 0.001$); as well as less general negative affect ($t[478] = -2.13, p = 0.02$). They also experienced marginally greater state gratitude ($t[481] = 1.36, p = 0.09$). Counter to our hypotheses, relative to controls, participants in the gratitude towards health group experienced lower levels of extrinsic motivation ($t[460] = -2.45, p = 0.007$). Further, there were no significant differences for humility ($t[470] = -0.04, p = 0.48$); guilt ($t[475] = 1.20, p = 0.12$); embarrassment ($t[478] = -0.89, p = 0.19$); shame ($t[478] = -0.92, p = 0.18$); discomfort ($t[478] = -0.19, p = 0.42$); improvement motivation ($t[464] = 1.19, p = 0.12$); or introjected motivation ($t[459] = -0.93, p = 0.18$).

8.2.4. Gratitude towards Academics vs. Control

As hypothesized, relative to controls, participants who expressed gratitude to someone who helped them with their academics reported greater feelings of state gratitude ($t[466] = 1.82, p = 0.048$); connectedness ($t[460] = 4.85, p < 0.001$); elevation ($t[463] = 7.01, p < 0.001$); indebtedness ($t[463] = 7.41, p < 0.001$); positive affect ($t[464] = 2.12, p = 0.02$); improvement motivation ($t[448] = 1.88, p = 0.03$); intended effort ($t[451] = 9.36, p < 0.001$); introjected motivation ($t[444] = 4.93, p < 0.001$); and identified motivation ($t[445] = 5.03, p < 0.001$); as well as less general negative affect ($t[464] = -1.69, p = 0.04$) and lower intrinsic motivation ($t[444] = -2.74, p = 0.003$). High school students who expressed gratitude towards someone who helped them with their academics did not report feeling significantly different levels of humility ($t[459] = 1.22, p = 0.11$); guilt ($t[463] = 0.51, p = 0.31$); embarrassment ($t[464] = -0.05, p = 0.48$); shame ($t[464] = -0.62, p = 0.27$); discomfort ($t[464] = -0.02, p = 0.49$); or extrinsic motivation ($t[445] = 1.07, p = 0.14$), relative to students who listed their daily activities.

8.3. Discussion

The findings of Study 2 suggest that in addition to boosting a sense of connectedness, elevation, and indebtedness, expressing gratitude led students to feel more motivated and capable of improving themselves, to express stronger intentions to muster effort towards self-improvement, and to strive to improve themselves specifically because of the fun and enjoyment it provides them and because they believed it was an important goal. Therefore, expressing gratitude may create the right environment for high school students to begin engaging in self-improvement behavior.

8.3.1. General Discussion

Replicating and extending the results of Layous, Sweeny [8], our studies with two very different samples provide further evidence that expressing gratitude may induce a mixed emotional experience. In Study 1, relative to those assigned to a neutral control condition, French-speaking employees who wrote gratitude letters reported higher levels of elevation, humility, indebtedness, and guilt, and marginally greater embarrassment and discomfort. However, participants writing gratitude letters in Study 1 did not experience greater gratitude, connectedness, shame, or lower general negative affect than controls.

Generally, the purpose of prompting participants to write gratitude letters is to induce a higher state of gratitude. Surprisingly, in Study 1, when we compared each specific gratitude condition to the control condition, only company employees in the gratitude towards kindness condition reported feeling more grateful. We may have found weaker effects in the gratitude towards health and work conditions because of the type of benefactors to whom employees in those conditions addressed their letters. Employees in the health and work conditions may not have felt grateful because they wrote letters to benefactors who were required to help as part of their jobs (e.g., a doctor providing nutritional advice,

a colleague explaining a work task), and thus were expected. These findings partially replicate a recent study with young adults that found those writing gratitude letters while trying to improve their health (e.g., eating more healthfully and exercising more) did not experience significant increases in state gratitude relative to controls [10]. Study 1 also demonstrated that the largest and most robust effects of gratitude interventions might not necessarily be grateful feelings but other states such as elevation and indebtedness, as has also been seen in recent research [9,10,65,71,72].

Although our interventions did not prompt greater state gratitude, they did impact some expected outcomes but not others. For example, despite prior research linking gratitude to increased social connection [21,24], French company employees in the gratitude conditions did not report feeling more connected to others relative to controls. This may have been because some of our interventions did not sufficiently prompt increased grateful feelings in these employees.

Regardless, these findings are still important because they show that gratitude letters do not always increase state gratitude or gratitude-induced outcomes across cultures. To the best of our knowledge, few gratitude interventions have been conducted in France. Thus, Study 1 recruited a unique sample that had not been tested previously. Relatedly, Chang and Algoe [73] found that people in Confucian cultures (Taiwanese) use self-improvement to communicate gratitude, whereas people in individualist cultures (Americans) use physical contact to convey it (Studies 1 and 2). Moreover, they found that both self-improvement and physical contact communicated gratitude for Americans, whereas only self-improvement communicated gratitude for Taiwanese.

Study 2 allowed us to further explore the impact of writing gratitude letters with over a thousand adolescents. As expected, immediately after expressing gratitude, relative to doing a neutral control task, 9th and 10th grade students reported increases in several positive states, including connectedness and elevation, and decreases in negative emotions. In contrast to a recent meta-analysis suggesting older adults may benefit more from gratitude interventions than younger adults [28], the U.S. adolescents in Study 1 often showed larger effects than French adults in Study 2. However, expressing gratitude did not appear to be as mixed of an emotional experience for adolescents in Study 2 as it was for adults in Study 1 (see also [8]). Although writing gratitude letters and reflecting on grateful experiences did make students feel more indebted, they did not report significantly higher levels of guilt, embarrassment, discomfort, or shame.

We also investigated the capacity of gratitude to motivate individuals. In Study 1, employees who expressed gratitude did not report greater self-improvement motivation relative to those instructed to list their daily activities. However, in Study 2, we found that students felt more confident and competent in their ability to improve themselves immediately after expressing gratitude than participants in the control condition. Students in the gratitude conditions also reported feeling more motivated to do better in their assigned domains because they anticipated enjoying it and believed in the goal's importance. This intrinsic and identified motivation is crucial in goal attainment, as people are more likely to put forth sustained effort into achieving self-concordant goals and are more likely to attain them [70]. Feeling competent, confident, and motivated could be life-changing for students who are transitioning into high school and perhaps beginning to feel insecure for the first time in their lives. These feelings could lead 9th and 10th graders to do better in school and achieve superior long-term benefits in well-being.

The results of the two studies suggest that different cultures, France and USA in the present research, might shape the experience of gratitude differently. This finding is in line with theorizing that different emotions emerge from cultural heterogeneity between French and American populations [74].

Overall, we found somewhat divergent effects across the two studies. Gratitude induced a more mixed emotional experience for employees than students. Students experienced greater improvement in motivation after expressing gratitude, but employees did not. Notably, our studies recruited two very different samples that varied by culture (France vs.

the USA), age (adults vs. adolescents), and context (employees vs. students). Any one of these factors could partly explain the differences in results. For example, adults may be more likely to feel guilty as they consider all of the things their benefactors, i.e., parents, mentors, and coaches, have done for them, while adolescents may be more likely to take such efforts for granted. Conversely, adolescent students at a transitional stage in their lives might be more open to improving themselves than older employees. Alternatively, perhaps the effects of expressing gratitude are stronger in the USA than in France, or perhaps we were better able to detect significant effect sizes in Study 1 due to its larger sample size. Finally, it is worth noting that the additional writing activities in Study 2 might also partly explain the differences in our results. For one of these reasons or another, writing gratitude letters may simply not have “worked” as well in Study 1 as it did in Study 2.

8.3.2. Future Directions and Limitations

Our research has several limitations that could be addressed in future studies. One limitation of Study 2 was that students read testimonials and wrote about their experiences with benefactors in addition to writing gratitude letters. The main goal of the larger project associated with Study 2 was to create an efficacious classroom intervention. The testimonial and reflection activities were added to accomplish that aim by directing students to focus more deeply on the thoughts and feelings prompted by gratitude expressions. Nonetheless, these additional activities may have also impacted our outcomes. Although Study 1 did test the effects of gratitude letters on many similar outcomes and found similar effects (without the added activities), future researchers should continue to separately test gratitude letters to isolate further the effects of expressing gratitude on emotion and motivation.

A limitation of both studies was using single-item questions (e.g., indebtedness, shame), as multi-item scales tend to outperform single items in terms of predictive validity [75]. Future studies could replicate these findings with multi-item, validated measures of socially oriented negative emotions (e.g., indebtedness, guilt) and improved motivation.

Notably, our studies yielded varying (small to medium) effect sizes. The variation and magnitude are not unexpected, given that each study sample originated from multiple, distinct groups. For example, employees in Study 2 lived in two different nations (France and Canada); students in Study 1 came from different socioeconomic statuses (low vs. high-income families). Regardless, our effect sizes are similar to those found in other positive activity and gratitude intervention meta-analyses [27,28,76,77], and even relatively small effects can aggregate over time to meaningfully impact outcomes [78]. Moreover, our relatively large sample sizes (especially in Study 2; $n = 1026$) give us greater confidence in the precision of our effect size estimates, as studies with larger samples tend to produce more accurate findings [78].

In the future, coding gratitude letters may be a potentially informative new direction. Letters could be coded for the presence of moderators, such as the type of benefactor written to, the magnitude of the help received, and the amount of effort exerted while writing the letter. For example, participants who expressed gratitude to benefactors simply doing their jobs (e.g., a co-worker helping with a work assignment) may feel less indebted than participants expressing gratitude to benefactors not obligated to help (e.g., a stranger pitching in to change a tire). Also, helping actions that require more effort from the benefactor (e.g., assisting with a cross-country move) may lead participants to feel more elevated than smaller actions (e.g., offering a compliment). Further, participants who spent more time on their gratitude letters, and wrote more, may have reflected more deeply on their experience and felt more grateful than those who exerted less effort. Such codings may yield a greater understanding of why some forms of gratitude expression (e.g., gratitude towards kindness) were more effective than others (e.g., gratitude towards work).

One of the strengths of our research is its reliance on two very different populations, i.e., French-speaking adult corporate employees and American adolescent high school students. Thus, our studies sampled from a wide variety of countries, cultures, educational backgrounds, socioeconomic statuses, and age groups. At the same time, however, both

samples were collected in Western, educated, industrialized, rich, and democratic (WEIRD) cultures, which are generally not representative of human experience as a whole [79]. As such, future studies should continue to explore the effects of expressing gratitude to new and different populations. Different cultures may vary in their comfort in expressing gratitude and, therefore, may also vary in the amount of positive and negative emotions and improvement motivation felt while expressing gratitude. For example, relative to their U.S. counterparts, people in Asian cultures (e.g., China) tend to experience significantly smaller (or no) gains in positive emotions from expressing gratitude [4,80]. Asian cultures may be more prone to feeling mixed emotions due to their propensity for simultaneously feeling positive and negative emotions [81,82], whereas Western cultures may feel fewer negative emotions due to a sense of entitlement or an emphasis on happiness [83,84]. Furthermore, an optimal age for expressing gratitude may lead to the highest amount of positive outcomes.

Furthermore, it would be interesting to consider the role culture plays in facilitating gratitude and its link to socially engaging vs. disengaging emotions and subjective well-being across different cultures. For example, Japanese participants tend to experience socially engaging emotions such as friendliness and guilt stronger than socially disengaging emotions such as pride and anger, whereas Americans show an opposite pattern. Among Japanese participants, socially engaging positive social emotions are also strongly associated with subjective well-being as compared with socially disengaging emotions. Again, this pattern works in reverse for Americans [85].

Future studies could also explore the types of gratitude or ways of expressing gratitude that would be purely positive or lead to less guilt, embarrassment, discomfort, and indebtedness. When prompting participants to write gratitude letters, researchers may need to acknowledge the potential socially oriented negative emotions a participant may feel and instruct them to set those emotions aside while writing. However, these negative emotions may also be motivating [9]. Future research should further explore whether experiencing negative emotions, such as guilt and indebtedness, can lead participants to go out of their way to repay their benefactors or pay kindnesses received forward to others.

Finally, although our studies demonstrated that expressing gratitude can immediately provoke mixed emotional states and greater self-improvement motivation, future research could further investigate how higher levels of gratitude-induced self-improvement motivation play out over longer periods of time and examine whether mixed emotions (e.g., connectedness together with indebtedness) can mediate improvements in well-being and self-improvement motivation. Notably, recent research from our lab derived from the larger project associated with Study 2 suggested that expressing gratitude helped high school students maintain higher levels of motivation and life satisfaction over the course of a semester [8]. These sustained levels of improvement in motivation and life satisfaction were partially mediated by increases in connectedness, elevation, and indebtedness.

9. Conclusions

Gratitude may be more than merely a passive, positive experience. Our studies provide evidence that expressing gratitude can induce both positive and negative states (e.g., elevation and indebtedness) and motivate people to exert greater effort towards self-improvement goals. Interestingly, our studies indicate that some of the biggest effects of gratitude exercises may not be increases in state gratitude, but rather, other states such as elevation and indebtedness. Significantly, gratitude letter writing activities are relatively quick and easy to implement in schools, companies, and organizations and could be used to promote a wide variety of desirable outcomes (e.g., greater career success, stronger social ties, and improved physical fitness). Over time, implementing gratitude activities may also lead to upward spirals [23]. For instance, students expressing gratitude may become more motivated and work harder, leading parents, teachers, and coaches to perceive them differently and perhaps offer more resources and support, thus, facilitating even greater

success. Accordingly, the mixed emotional states induced by gratitude may play a vital role in motivating people, allowing them to become better versions of themselves.

Supplementary Materials: The following are available online at <https://www.mdpi.com/article/10.3390/su14148679/s1>, File S1: file with condition instructions. Refs. [14,31,66,86–96] are cited in Supplementary Materials.

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