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The role of actors, targets, and witnesses: Examining gratitude exchanges in a social context

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ABSTRACT

Gratitude science often conflates the processes of *actors recalling* and *sharing* gratitude, as well as neglecting to study *targets* (benefactors *receiving* gratitude) and *witnesses* (those *witnessing* gratitude). We explored the roles (actors, targets, and witnesses) and processes (recalling, sharing, receiving, and witnessing) involved in gratitude exchanges. In Study 1, undergraduate students (actors; $N = 369$) wrote letters about either gratitude or daily activities to their parents (targets; $N = 247$), with half instructed to share their letters with their parents, and half not to share. In Study 2, adolescents (witnesses; $N = 267$) read either gratitude, positive, or neutral letters written by hypothetical peers addressed to benefactors. Actors recalling gratitude showed improvements in state gratitude, mood, and satisfaction (partial $r_s = .11$ to $.15$; Study 1); actors sharing gratitude experienced boosts in state gratitude and relationship closeness ($r_s = .13$ to $.19$; Study 1); targets receiving gratitude demonstrated increases in state gratitude, indebtedness, and elevation ($r_s = .14$ to $.16$; Study 1); and witnesses observing gratitude reported increased positive affect and elevation ($r_s = .24$), but decreased state gratitude ($r = -.12$; Study 2). These studies provide initial evidence that different gratitude roles and processes have divergent effects.

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Gratitude; well-being; emotion; social; positive activity intervention

“Gratitude can make your life happier and more satisfying. . . . When we express our gratitude to others, we strengthen our relationship with them.”—Martin E. P. Seligman, *Flourish*

“Gratitude . . . is a quality like electricity: it has to be produced, projected and consumed all in the same instant to exist at all.” —William Faulkner, *The Town*

Throughout history, gratitude has been rooted and celebrated within multiple religious, philosophical, and cultural traditions, including the holy books of most major religions (e.g., Buddhism, Christianity, Islam), as well as the writings of philosophers (e.g., Thomas Aquinas, Adam Smith), playwrights (e.g., Shakespeare), and novelists (e.g., Charles Dickens, William Faulkner; Emmons & Hill, 2001; McCullough et al., 2001). In the modern era, parents teach their children to say ‘thank you,’ and adults often post messages of appreciation on social media (Glasgow et al., 2016; McAdams & Bauer, 2004). Yet only in the last few decades has gratitude become the subject of empirical research (Wood et al., 2016).


Gratitude, derived from the Latin word *gratia*, meaning favor (Emmons & McCullough, 2004), has been popularly defined as wanting to express thanks

(Oxford, n.d.). In the psychological literature, researchers have defined gratitude in various ways – calling it a moral virtue, an attitude, an emotion, a habit, a personality trait, and a coping response (Emmons et al., 2003). Yet, the most oft-cited definition of gratitude describes it as a state that requires someone to recognize that they have acquired a positive outcome that came from an external source (Emmons & McCullough, 2003).

However, gratitude is not a unitary construct, but may be conceptualized as having four separate components: (1) *cognitive* (conceptual understandings), (2) *affective* (grateful feelings), (3) *attitudinal* (beliefs about gratitude’s importance), and (4) *behavioral* (recognizing and showing gratitude; Morgan et al., 2017). Research also suggests that gratitude may be assessed at both a trait and state level, with trait gratitude being linked to inherent individual differences that a person carries with them across situations and state gratitude being affected by specific situational factors like receiving a gift (Wood et al., 2008). Other researchers have further proposed two distinct types of gratitude: (1) *generalized gratitude*,

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Data, materials, and R code are available on the Open Science Foundation (OSF) for Studies 1 and 2 at <https://osf.io/xj6s9>. Study 2 was pre-registered. We have no known conflicts of interest to disclose. Our work was funded by the John Templeton Foundation (Grant 61113) and supported by the Character Lab Research Network.

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which involves appreciating various positive aspects of one's life, and (2) *benefit-triggered* gratitude, which is prompted by actions performed by a benefactor (Lambert et al., 2009). The present studies focus on benefit-triggered state gratitude and examine its cognitive, affective, and behavioral components.

In 2005, Martin E. P. Seligman and his colleagues developed a paradigm called the *gratitude visit*, a positive activity intervention in which participants (whom we call actors) were instructed to write and deliver a letter of gratitude in person to someone who was especially kind to them (Seligman et al., 2005). The original study found well-being benefits for actors ($\lambda^2=.49$ at posttest), but did not assess well-being effects for the targets (i.e., recipients or benefactors) of gratitude. Dozens of studies testing gratitude letters followed, with more published every year (e.g., Armenta et al., 2020; Boehm et al., 2011; Davis et al., 2015; Fritz et al., 2019; Froh et al., 2009; Layous et al., 2013, 2017; Lyubomirsky et al., 2011; Toepfer et al., 2012; Walsh et al., 2021). To date, various investigations have established the benefits of expressing gratitude for improved social relationships (Algoe et al., 2010; Lambert et al., 2010), physical health (Emmons & McCullough, 2003; Fritz et al., 2019), and psychological well-being (Boehm et al., 2011; Lyubomirsky et al., 2011). Yet most empirical research on the subject has focused primarily on the person expressing gratitude (*actors*) – either *recalling* it privately in their minds or directly *sharing* it with benefactors – without disentangling these two separate processes. Many studies also do not assess effects on other key players involved in gratitude interactions, such as *targets receiving* gratitude and *witnesses observing* gratitude exchanges.

Actor-target-witness framework

Bringing together research and theory in gratitude science, we propose a new Actor-Target-Witness conceptual framework (see Figure 1). We begin by introducing terminology to describe the various roles and processes involved in gratitude, unpacking them step-by-step, and

using vignettes to illuminate each term. We believe this framework could be useful to the field and potentially advance well-being science.

Notably, gratitude researchers have frequently used the phrase 'express gratitude' to refer to gratitude expressions that are thought, written, or spoken to the self or an imagined other (e.g., Armenta et al., 2020; Kruse et al., 2014; Tomasulo, 2019; Watkins et al., 2003) or delivered directly to a real-life benefactor (e.g., Froh et al., 2009; Seligman et al., 2005; Toepfer et al., 2012). We argue that sharing gratitude directly with a benefactor is a separate process that should be disentangled from reflecting on gratitude in one's own mind. Moreover, the term *express* appears to be conflated in the literature (i.e., express how and to whom), so we have opted to step away from it. To this end, in the interests of clarity, we define *recalling* gratitude as when actors are simply thinking grateful thoughts to themselves (in their head or in writing). We define *sharing* gratitude as when actors are conveying their gratitude directly to their benefactor.

The Actor-Target-Witness framework describes up to three potential roles in any one specific benefit-triggered gratitude interaction – namely, (1) actors, (2) targets, and (3) witnesses. Furthermore, up to four separate psychological processes may be occurring: (1) recalling, (2) sharing, (3) receiving, and (4) witnessing. First, as illustrated in Figure 1 (Vignette 1), if an actor named Jaden (whose name means 'thankful') sits down at his desk and writes a letter of gratitude to a benefactor (his dad) – but does not share his letter – then we would say that Jaden is *recalling* gratitude. Second, if our actor Jaden subsequently delivers his letter of gratitude to his father, then we would say that Jaden is *sharing* gratitude (see Figure 1, Vignette 2). Third, we could investigate the effects of *receiving* gratitude on the target (dad; see Figure 1, Vignette 3). Finally, we could explore the impact of *witnessing* gratitude on a witness (Sakshi, whose name means 'witness') if she observes the actor (Jaden) deliver his gratitude letter to the target (dad; see Figure 1, Vignette 4).

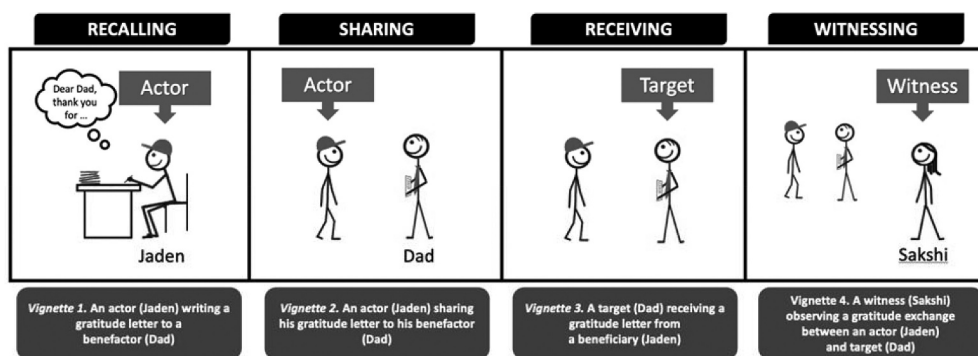


Figure 1. Actor-target-witness framework. This figure demonstrates actors recalling (vignette 1) and sharing (vignette 2) gratitude, targets receiving gratitude (vignette 3), and witnesses witnessing (or observing) gratitude (vignette 4).

Notably, we have described how the Actor-Target-Witness framework specifically applies to the gratitude visit, but this framework could also apply to gratitude as it plays out within the wider world. When a wife thanks her husband, an actor (the wife) is sharing gratitude, and a target (the husband) is receiving it. When a brother thanks his sister on her Facebook wall, the numerous people (witnesses) who 'like' and comment on it are all witnessing gratitude.

Previous research on actors, targets, and witnesses

To our knowledge, this conceptual framework has not previously been proposed or tested in a single research project. Yet numerous prior studies have examined its various elements, such as testing the effects of actors recalling and sharing gratitude on a wide variety of outcomes, including subjective happiness, life satisfaction, positive affect, negative affect, social connectedness, elevation, indebtedness, and even healthy eating behavior (e.g., Armenta et al., 2020; Davis et al., 2015; Fritz et al., 2019; Froh et al., 2009). However, such studies typically refer to anything an actor does as 'expressing gratitude,' rendering it difficult to separate the effects of recalling from the effects of sharing. Thus, more research is needed to determine whether the previously documented effects vary for actors.

Previous gratitude studies focusing on actors have tested a variety of outcomes, some more frequently than others. Subjective well-being (e.g., positive affect and life satisfaction) has been widely assessed and meta-analyzed (Davis et al., 2015). In addition, several experiments from our laboratory show that, not surprisingly, gratitude can induce indebtedness (i.e., feeling a need to repay a debt), as well as other socially-oriented negative emotions such as guilt, embarrassment, discomfort, and shame – all uncomfortable emotions that may reduce well-being but motivate self-improvement (Armenta et al., 2020; Fritz et al., 2019; Layous et al., 2017; Walsh et al., 2021). Because gratitude is commonly felt towards particular individuals in one's life, these and other studies have also linked gratitude to increased social connection (i.e., feelings of intimacy, bonding, and connectedness). Elevation – feeling touched and inspired after 'witnessing another person perform a virtuous act, principally one that improves the welfare of other people' (Schnall et al., 2010, p. 315) – is another outcome of gratitude exchanges, likely due to the actor's desire to replay their benefactors' kindness or make them proud (e.g., Layous et al., 2017).

A smaller body of work has examined the effects of targets receiving gratitude, examining outcomes such as positive emotions, relationship satisfaction, affiliative behavior, relationship quality, and prosocial behavior (Algoe et al., 2013, 2016; Algoe & Zhaoyang, 2016; Grant & Gino, 2010). Critically, these studies – and the theory motivating them – have made important contributions to the literature. According to find-remind-and-bind theory, the evolutionary function of gratitude is to aid individuals in finding new – or reminding of known – high-quality relationship partners, and binding both actors and targets together (Algoe, 2012). Accordingly, gratitude serves to strengthen relationships with responsive interaction partners (i.e., targets that understand, value, and care about the actor; Algoe et al., 2008; cf. Reis & Clark, 2013). However, because the focus of this body of research is on dyadic relationships, these studies typically instruct participants to simultaneously share and receive gratitude within the context of a relationship (e.g., between romantic partners) – making it difficult to separate the effects of actors sharing from the effect of targets receiving.

A few additional studies have specifically investigated the psychology of targets. For example, Grant and Gino (2010) found that participants (targets) who were thanked for a prosocial act (editing a student's cover letter), relative to those who received a neutral message, were more likely to engage in more prosocial behavior later. Furthermore, Kumar and Epley (2018) found that 'expressors' (actors) who wrote gratitude letters underestimated how surprised and happy – and overestimated how awkward – the recipients (targets) would feel.

Finally, to our knowledge, only a single publication has explored the effects of witnessing gratitude (Algoe et al., 2020). The authors asked mTurkers to correct typos for a movie review. Participants (witnesses) corrected more typos (i.e., engaged in more prosocial behavior) when they observed the author of the movie review (actor) say 'thank you' to a previous mTurker (target), relative to neutral ('Ok') and positive ('Congratulations on finishing the editing!') controls. In another study, participants (witnesses) who watched a video showing an actor sharing gratitude with a target wanted to affiliate more with that actor and target. Overall, Algoe et al. (2020) studies examined the effects of witnessing on a variety of interesting outcomes, such as helping and affiliative behavior. The researchers concluded that gratitude may have group-level effects that help build multiple relationships within social networks.

Yet the focus of these studies was not on witnesses' subjective well-being, leaving future investigators to assess the effects of observing gratitude on

such outcomes as positive affect and life satisfaction. As gratitude researchers, we have read thousands of gratitude letters from numerous studies. Having witnessed gratitude firsthand, we anticipate that witnesses will also experience significant well-being benefits themselves. Furthermore, an important reason that observing gratitude exchanges makes people happy is that witnessing the goodness of others can be moving and inspiring. Thus, we anticipate that the emotion of elevation may serve as an important mediator underlying the well-being effects in witnesses.

Current studies

Motivated by the Actor-Target-Witness framework, in two studies, we explored the roles (actors, targets, and witnesses) and processes (recalling, sharing, receiving, and witnessing) involved in gratitude exchanges in a social context. In Study 1, we recruited undergraduate students (actors) and asked them to write either gratitude letters or letters about their daily activities to parents (targets), who were also recruited into the study. Students were subsequently instructed to share (or not share) their letters with their parents. In Study 2, we recruited adolescents (witnesses) to read either gratitude, positive, or neutral letters.

We hypothesized that actors, targets, and witnesses would all experience well-being benefits from recalling, sharing, receiving, and witnessing gratitude. We also anticipated that those benefits would differ by role (e.g., actor vs. target) and process (e.g., recalling vs. recalling plus sharing) across studies. In sum, we conducted an initial test of our theoretical framework in an effort to expand knowledge about the benefits and costs of gratitude within social networks.

Study 1

Study 1 sought to examine the effects of recalling and sharing gratitude on actors, as well as the effects of receiving gratitude on targets. To this aim, (student) actors were randomly assigned to one of four conditions in a 2×2 experimental design: (1) Gratitude Shared, (2) Gratitude Unshared, (3) Activities Shared, and (4) Activities Unshared. Their (parent) targets were paired with them into the same condition. Study 1 was not pre-registered on the Open Science Framework (OSF) because data collection started before we and other labs began regularly pre-registering studies. However, data, materials, and R code are available for Study 1 on the OSF at <https://osf.io/xj6s9>.

We focused on three primary research questions in this study. First, what is the impact of solely writing a gratitude letter and keeping it private (i.e., recalling gratitude) on actors (Hypothesis 1)? Second, what is the impact of both writing and delivering a gratitude letter (i.e., sharing gratitude) on actors (Hypotheses 2 and 3)? Finally, what is the impact of receiving a gratitude letter on targets (Hypotheses 4 and 5)?

Hypotheses.

Actors.

Based on previous research, we tested the following hypotheses for (student) actors.

Hypothesis 1. Students who write a gratitude letter will experience greater improvements in our outcomes (state gratitude, subjective well-being, indebtedness, elevation, connectedness, and relationship closeness) than students who write a daily activities letter (Gratitude vs. Activities).

Hypothesis 2. Students who go on to share their letter after writing it will experience greater improvements in outcomes than students who do not share (Shared vs. Unshared).

Hypothesis 3. Relative to those assigned to the three other conditions (Gratitude Unshared, Activities Shared, and Activities Unshared), student (actors) in the Gratitude Shared condition (i.e., students who write a gratitude letter and share it) will experience the biggest improvements in outcomes.

Targets.

To address our third research question regarding (parent) targets, we included two separate hypotheses that were comparable to our predictions for (student) actors.

Hypothesis 4. Parallel with Hypothesis 2, parents who receive any social interaction (whether gratitude or activities) will experience greater improvements in outcomes than parents in the unshared groups.

Hypothesis 5. Parallel with Hypothesis 3, relative to targets in all other conditions, targets in the Gratitude Shared condition (i.e., parents who receive a gratitude sharing interaction) will experience the biggest improvements in outcomes.

Method.

Participants.

Actors. Undergraduates at a large public university ($N=369$; $M_{age}=19.52$, $SD=3.18$; 78.7% female) were recruited from the Psychology department's online research participation system and offered course credit in exchange for their participation. We aimed to recruit 100 participants per condition for actors (target $N=400$; Vazire, 2014). We succeeded in recruiting 418 actors, but using our exclusion criteria reduced the sample size to 369. Their ethnicities were Hispanic (37.6%), Asian (28.9%), White (14.4%), Black (4.1%), more than one (8.7%), and other (6.3%). We asked student participants to recruit one parent into the study to participate with them. However, if the parent did not respond, the student completed the study without them. Student actors were excluded from analyses if they did not complete Time 2 (9 excluded) or if they reported not following sharing instructions at Time 3 (40 excluded).

Targets. Parent participants ($N=247$; $M_{age}=47.12$, $SD=8.73$; 77.7% female) were recruited via email. We also aimed to recruit 100 participants per condition for targets (target $N=400$; Vazire, 2014). However, due to the difficulty in recruiting busy working parents, we succeeded in recruiting a sample size of only 266 targets, which was reduced to 247 after our exclusion criteria. Their ethnicities were Hispanic (33.2%), Asian (31.5%), White (25.3%), other (3.8%), more than one (3.3%), and Black (2.9%). Most parents were married (74.8%); the remainder were single (12%), separated/divorced (12%), or widowed (1.2%). Education levels varied from post-baccalaureate/graduate school (19.9%), to college graduate (29%), some college (25.7%), and high school graduate (15.4%); with some having not completed high school (10%). Parents could complete surveys in either English (84.6%) or Spanish (15.4%) and were given entry into a raffle for one of three \$100, \$75, or \$50 Amazon digital gift cards. Parent target participants were excluded from analyses if they reported they did not receive a sharing experience from their child at Time 3 (19 excluded). Exclusions for the actors/students and targets/parents were independent. We did not cross-

reference the reports of parents and students, but excluded individuals based merely on their own self-report. These exclusions resulted in some unequal cell sizes in our study.

Procedure.

Figure 2 presents an overview of the Study 1 timeline.

Actors.

At Time 1 (T_1), students logged in to an external online survey where they consented and provided the email address of their parent. Students next completed personal demographic information, outcome measures, and were randomly assigned to one of four conditions in a 2×2 between-subjects design: (1) to write a gratitude letter and share it with their parent (Gratitude Shared; $n = 74$); (2) to write a gratitude letter and not share it (Gratitude Unshared; $n = 102$); (3) to write a daily activities letter and share it with their parent (Activities Shared; $n = 87$); and (4) to write a daily activities letter and not share it (Activities Unshared; $n = 106$). A week after T_1 , students logged in again at Time 2 (T_2) to complete a 10-minute writing activity (gratitude or daily activities letter), as well as T_2 measures. Students then had a week to share (or not share) the letter with their parents according to their assigned condition instructions, after which they logged in a week later at Time 3 (T_3) to complete a final series of measures.

At T_2 , students assigned to the Gratitude groups were instructed to remember a time their parent did something to help them (e.g., helped with a school project, cooked a meal), and write a letter recalling their gratitude for these kind acts. Students in the Activities groups were directed to write a letter to their parent describing their activities over the past 7 days (e.g., studying for an exam, eating at a restaurant). Students in the Gratitude Shared and Activities Shared groups were directed to save a copy of the letter they wrote and have an in-person, face-to-face conversation with their parent using the letter as a prompt to either share their gratitude or discuss the things they had done over the past week. If

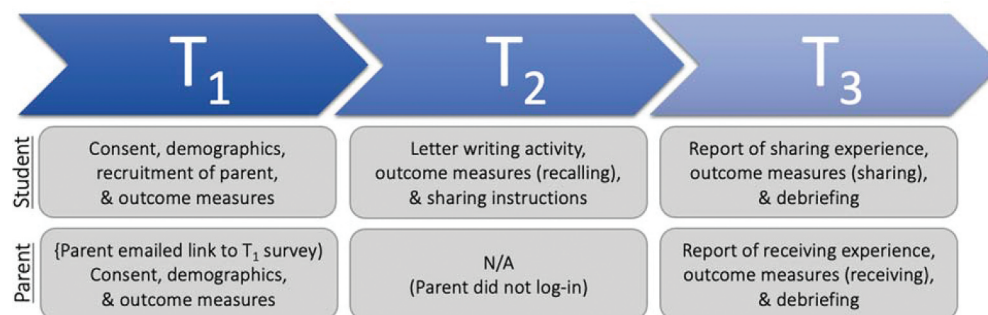


Figure 2. Study 1 timeline for actors and targets. T_1 through T_3 occurred at weekly intervals.

an in-person, face-to-face conversation was not possible, we asked students to call their parent and have a phone conversation. Students in the Gratitude Unshared and Activities Unshared groups were instructed to save a copy of the letter to keep on file and not share it with their parent. At T_3 , student participants in the Shared groups indicated (with a 'Yes' or 'No' question) whether they had shared their letter with their parent, and if they indicated 'Yes,' they were asked a few brief questions and directed to write for 5 minutes about the experience. See Supplemental Materials for all condition instructions.

Targets.

Soon after students completed T_1 , parents were emailed a link to their own T_1 survey and were instructed to log-in, consent, and complete a first series of measures (before their child completed T_2). Parents were paired with their children into dyads and assigned to the same condition (Gratitude Shared, $n = 49$; Gratitude Unshared, $n = 73$; Activities Shared, $n = 54$; Activities Unshared, $n = 71$). They did not perform a writing activity or receive sharing instructions, but were the recipients (or non-recipients) of their child's (the student's) assigned writing and sharing activity. Thus, parents did not complete a T_2 survey.

Parents logged in for a second and final time at T_3 . Participants in the Gratitude Shared and Activities Shared groups indicated with a 'Yes' or 'No' question whether their child had recently reached out to them to share gratitude or discuss their daily activities. If parents indicated 'Yes,' they were asked a few brief questions and directed to write for 5 minutes about the experience. Parents in all conditions then completed another series of measures and received a final debriefing.

Measures.

Both student actors and parent targets completed the following outcome measures at all time points.

State gratitude.

We assessed grateful feelings with a state version of the Gratitude Questionnaire-6 (GQ-6; McCullough et al., 2002), which has been adapted in previous studies (Armenta et al., 2020; Fritz et al., 2019; Shin et al., 2020). This measure also served as a manipulation check. The GQ-6 is composed of 6 items (e.g., 'Right now I feel I have much in life to be thankful for') rated from 1 (*strongly disagree*) to 7 (*strongly agree*). Scale reliabilities (McDonald's omegas [ω_s]) ranged from .83 to .86 across time points for (student) actors, and ω_s ranged from .81 to .82 for (parent) targets.

Mood and satisfaction sliders.

Adapted from the brief Weekly Affect and Satisfaction Measure (Jacobs Bao, 2013), we assessed overall mood ('How do you feel right now?') and satisfaction ('How satisfied with your life are you right now?') with two separate, 1-item sliders ranging from 0 to 100.

Positive and negative affect.

Participants completed a modified Affect-Adjective Scale (AAS; Diener & Emmons, 1985) to assess levels of positive and negative emotions. The scale included 4 positive items (e.g., happy, pleased) and 5 negative items (e.g., worried/anxious, depressed/blue) rated from 1 (*not at all*) to 7 (*extremely*). Positive affect $\omega_s = .92$ to $.93$ for actors and $.89$ to $.93$ for targets. Negative affect $\omega_s = .84$ to $.88$ for actors and $.87$ to $.89$ for targets.

Life satisfaction.

Participants also reported their life satisfaction on the 5-item Satisfaction With Life Scale (SWLS; Diener et al., 1985). Example items include 'The conditions of my life are excellent,' rated on a 7-point scale (1=*strongly disagree*; 7=*strongly agree*). Actor ω_s ranged from $.85$ to $.87$, and target ω_s ranged from $.87$ to $.88$.

Indebtedness.

Based on previous research from our lab (Armenta et al., 2020; Walsh et al., 2021), we adapted a 3-item indebtedness composite that asked participants to rate how much they experienced specific feelings (e.g., 'indebted,' 'duty-bound,' 'obligated'), rated on a 7-point scale (1=*not at all*; 7=*extremely*). Actor ω_s ranged from $.77$ to $.88$, and target ω_s ranged from $.78$ to $.82$.

Elevation.

We asked both actor and target participants to complete a 6-item elevation questionnaire (Schnall et al., 2010) on a 7-point scale from 1 (*do not feel at all*) to 7 (*feel very strongly*). Examples items include feeling 'uplifted' and 'a warm feeling in your chest.' Across time points, both actor and target ω_s ranged from $.80$ to $.83$.

Connection.

Participants reported their feelings of social connectedness using the 6 relatedness items from the Balanced Measure of Psychological Needs (BMPN; Sheldon & Hilpert, 2012). Example items include 'I feel close and connected with other people who are important to me,' which are rated on a 5-point scale (1=*no agreement*; 5=*much agreement*). Actor ω_s ranged from $.67$ to $.69$, and all target ω_s were $.70$.

Relationship closeness.

To assess relationship closeness, we used the Inclusion of Other in Self (IOS) Scale (Aron et al., 1992), a single-item pictorial measure that asks participants to rate their interpersonal closeness with a specific other. Respondents were asked to select the picture that best

describes their relationship from a set of Venn-like diagrams, each representing different degrees of overlap and relationship closeness (1=no overlap, least relationship closeness; 7=nearly complete overlap, most relationship closeness). Student actor participants were asked to rate their relationship with the parent they recruited into the study, and parent targets were asked to rate their relationship with the child who recruited them into the study.

Results.

Actors.

To test our hypotheses for actors, we ran regressed (i.e., residualized) change analyses predicting T_2 or T_3 scores from hypothesized condition dummy codes, controlling for T_1 scores. Regression coefficients were converted to partial correlations for ease of interpretation and comparability between models. See Table 1 for the results of the regressed change analyses for actors, as well as supplemental materials for actor means (Table S1) and bivariate correlations (Table S2). Because our analyses used some data exclusions (e.g., removing actors that did not share at T_3), we also ran intention-to-treat (ITT) analyses that included all participants randomized to condition. For all ITT analyses in both Study 1 and Study 2, we found the effects to be almost identical and only slightly weaker (i.e., reducing partial r s on average by $-.01$). These results are presented in Supplemental Materials (see Table S3).

Hypothesis 1: Effects of Actors Recalling Gratitude at T_2 . First, to test whether actors assigned to write gratitude letters experienced greater increases in our outcomes than those assigned to write activities letters, we ran regressed change models predicting T_2 scores. Condition was dummy-coded so the Activities conditions served as the reference group (see Table 1, Hypothesis 1). In support of our first hypothesis, students writing gratitude letters reported greater increases in state gratitude (partial $r=.15$, $p=.006$), as well as on the mood slider (partial $r=.10$, $p=.048$) and the satisfaction slider (partial $r=.11$, $p=.038$), than those writing activities letters. We did not find statistically significant differences for positive affect (partial $r=.06$, $p=.227$), negative affect (partial $r=-.04$, $p=.448$), life satisfaction (partial $r=.07$, $p=.158$), indebtedness (partial $r=.06$, $p=.295$), elevation (partial $r=.07$, $p=.184$), connection (partial $r=-.01$, $p=.895$), or relationship closeness (partial $r=.01$, $p=.897$).

Hypothesis 2: Effects of Actors Sharing a Social Interaction at T_3 . We next tested whether actors who shared their letters (Gratitude Shared and Activities Shared) experienced greater improvements in outcomes

than those who did not share (Gratitude Unshared and Activities Unshared). To this aim, we ran regressed change analyses predicting T_3 scores (see Table 1, Hypothesis 2). This time the Unshared groups served as the reference group. Students who shared their letters, relative to those who did not, reported significantly larger improvements in gratitude (partial $r=.16$, $p=.002$), mood (partial $r=.12$, $p=.025$), positive affect (partial $r=.13$, $p=.013$), elevation (partial $r=.16$, $p=.003$), and relationship closeness (partial $r=.12$, $p=.019$). No significant group differences emerged on the satisfaction slider (partial $r=.06$, $p=.222$), negative affect (partial $r=.00$, $p=.973$), life satisfaction (partial $r=.07$, $p=.188$), indebtedness (partial $r=.05$, $p=.313$), and connection (partial $r=.05$, $p=.33$).

Hypothesis 3: Effects of Actors Sharing Gratitude vs. Other Groups at T_3 . Next, we tested whether actors sharing gratitude at T_3 demonstrated the greatest improvements in outcomes relative to all three other conditions (see Table 1, Hypothesis 3). Our analyses showed that actors sharing gratitude reported significantly greater increases in gratitude (partial $r=.19$, $p<.001$) and relationship closeness (partial $r=.13$, $p=.015$) than those in the other three groups. We did not find statistically significant differences for the mood slider (partial $r=.10$, $p=.061$), satisfaction slider (partial $r=.09$, $p=.077$), positive affect (partial $r=.04$, $p=.437$), negative affect (partial $r=.02$, $p=.734$), life satisfaction (partial $r=.02$, $p=.651$), indebtedness (partial $r=.09$, $p=.093$), elevation (partial $r=.10$, $p=.067$), or connection (partial $r=.01$, $p=.852$).

Targets.

We also used regressed change analyses predicting T_3 scores from condition dummy codes, controlling for T_1 scores to test our target-specific hypotheses. For targets, see Table 2 for regressed change analyses. See Supplemental Materials for target means (Table S4), bivariate correlations (Table S5), and ITT analyses (Table S6).

Hypothesis 4: Effects of Targets Receiving a Social Interaction at T_3 . To test the effects of targets receiving a shared social interaction (Hypothesis 4), we used a similar approach to Hypothesis 2 (see Table 2, Hypothesis 4), with the Unshared conditions coded as the reference group. Relative to those who received no social interaction, targets who received a shared gratitude or activities interaction from their child reported no significant changes in any of our outcome variables, including state gratitude (partial $r=.12$, $p=.061$), mood (partial $r=.06$, $p=.386$), the satisfaction slider (partial $r=$

Table 1. Study 1 actor regressed change models.

Variable	<i>b</i>	<i>b SE</i>	<i>t</i>	<i>p</i>	Partial <i>r</i>	Partial <i>r</i> 95% CI LL	Partial <i>r</i> 95% CI UL
Hypothesis 1. T₂ Gratitude vs. Activities Groups:							
Gratitude	0.20	0.07	2.79	0.006	0.15	0.04	0.24
Mood Slider	3.65	1.84	1.99	0.048	0.10	0.00	0.20
Satisfaction Slider	3.50	1.68	2.08	0.038	0.11	0.01	0.21
Positive Affect	0.14	0.11	1.21	0.227	0.06	-0.04	0.17
Negative Affect	-0.08	0.10	-0.76	0.448	-0.04	-0.14	0.06
Life Satisfaction	0.11	0.08	1.41	0.158	0.07	-0.03	0.18
Indebted	0.15	0.14	1.05	0.295	0.06	-0.05	0.16
Elevation	0.15	0.11	1.33	0.184	0.07	-0.03	0.17
Connection	-0.01	0.06	-0.13	0.895	-0.01	-0.11	0.10
Relationship Closeness	0.01	0.09	0.13	0.897	0.01	-0.10	0.11
Hypothesis 2. T₃ Shared vs. Unshared Groups:							
Gratitude	0.23	0.07	3.08	0.002	0.16	0.06	0.26
Mood Slider	4.28	1.90	2.25	0.025	0.12	0.01	0.22
Satisfaction Slider	2.05	1.67	1.22	0.222	0.06	-0.04	0.17
Positive Affect	0.29	0.12	2.49	0.013	0.13	0.03	0.23
Negative Affect	0.00	0.11	-0.03	0.973	0.00	-0.11	0.10
Life Satisfaction	0.12	0.09	1.32	0.188	0.07	-0.03	0.17
Indebted	0.15	0.14	1.01	0.313	0.05	-0.05	0.16
Elevation	0.36	0.12	3.04	0.003	0.16	0.06	0.26
Connection	0.06	0.06	0.98	0.330	0.05	-0.05	0.15
Relationship Closeness	0.24	0.10	2.37	0.019	0.12	0.02	0.22
Hypothesis 3. T₃ Gratitude Shared vs. Other Conditions:							
Gratitude	0.34	0.09	3.69	<.001	0.19	0.09	0.29
Mood Slider	4.46	2.37	1.88	0.061	0.10	0.00	0.20
Satisfaction Slider	3.68	2.08	1.77	0.077	0.09	-0.01	0.19
Positive Affect	0.12	0.15	0.78	0.437	0.04	-0.06	0.14
Negative Affect	0.05	0.13	0.34	0.734	0.02	-0.09	0.12
Life Satisfaction	0.05	0.11	0.45	0.651	0.02	-0.08	0.13
Indebted	0.30	0.18	1.68	0.093	0.09	-0.01	0.19
Elevation	0.27	0.15	1.84	0.067	0.10	-0.01	0.20
Connection	0.01	0.08	0.19	0.852	0.01	-0.09	0.11
Relationship Closeness	0.30	0.12	2.45	0.015	0.13	0.03	0.23

Hypothesized condition dummy codes predicting actors' T₂ or T₃ scores, controlling for T₁ scores. CI = confidence interval; LL = lower limit; UL = upper limit.

-.05, $p=.442$), positive affect (partial $r=.11$, $p=.112$), negative affect (partial $r=.02$, $p=.721$), life satisfaction (partial $r=.01$, $p=.89$), indebtedness (partial $r=-.01$, $p=.857$), elevation (partial $r=.13$, $p=.055$), connection (partial $r=.01$, $p=.867$), or relationship closeness (partial $r=-.06$, $p=.351$).

Hypothesis 5: Effects of Targets Receiving Gratitude at T₃. Finally, we tested whether targets receiving gratitude benefited more than those assigned to the three other conditions (see Table 2, Hypothesis 5). In support of our final Study 1 hypothesis, participants in the Gratitude Shared condition demonstrated significantly greater state gratitude (partial $r=.14$, $p=.031$), indebtedness (partial $r=.15$, $p=.023$), and elevation (partial $r=.16$, $p=.019$). No significant differences emerged for the mood slider (partial $r=.10$, $p=.131$), satisfaction slider (partial $r=.07$, $p=.272$), positive affect (partial $r=.05$, $p=.428$), negative affect (partial $r=-.01$, $p=.895$), life satisfaction (partial $r=.03$, $p=.673$), connection (partial $r=-.03$, $p=.685$), or relationship closeness (partial $r=-.06$, $p=.346$).

Discussion.

In summary, in our first study, (student) actors who were prompted to recall gratitude (i.e., write gratitude letters) to their (parent) targets reported immediate

improvements in their feelings of gratitude, mood, and overall satisfaction, relative to those prompted to write about their activities, but did not demonstrate benefits on other outcomes commonly impacted in the gratitude literature, such as life satisfaction or connectedness. Actors who went on to share their gratitude directly with their parent additionally reported boosts in gratitude and relationship closeness, relative to the other three conditions. These findings suggest that sharing gratitude with benefactors may have different benefits from recalling it.

Notably, sharing a social interaction of any kind with their parents – whether it involved thanking their parents or sharing their experiences at college – yielded significant benefits for students on a number of outcomes – for example, bolstering not only gratitude, mood, and positive affect but also feelings of elevation and relationship closeness.

Finally, parents who received a gratitude letter from their child reported significant boosts in their feelings of gratitude, indebtedness, and elevation (but not in subjective well-being). Receiving a social interaction of any kind – whether gratitude or activities – did not yield any statistically significant improvements for parents.

Table 2. Study 1 target regressed change models.

Variable	<i>b</i>	<i>b SE</i>	<i>t</i>	<i>p</i>	Partial <i>r</i>	Partial <i>r</i> 95% CI LL	Partial <i>r</i> 95% CI UL
Hypothesis 4. T₃ Shared vs. Unshared Groups:							
Gratitude	0.16	0.09	1.88	0.061	0.12	-0.01	0.25
Mood Slider	1.68	1.93	0.87	0.386	0.06	-0.07	0.19
Satisfaction Slider	-1.45	1.88	-0.77	0.442	-0.05	-0.18	0.08
Positive Affect	0.19	0.12	1.60	0.112	0.11	-0.03	0.23
Negative Affect	0.04	0.10	0.36	0.721	0.02	-0.11	0.15
Life Satisfaction	0.02	0.11	0.14	0.89	0.01	-0.12	0.14
Indebted	-0.03	0.15	-0.18	0.857	-0.01	-0.14	0.12
Elevation	0.24	0.13	1.93	0.055	0.13	0.00	0.25
Connection	0.01	0.06	0.17	0.867	0.01	-0.12	0.14
Relationship Closeness	-0.15	0.16	-0.93	0.351	-0.06	-0.19	0.07
Hypothesis 5. T₃ Gratitude Shared vs. Other Conditions:							
Gratitude	0.23	0.11	2.17	0.031	0.14	0.01	0.27
Mood Slider	3.55	2.34	1.52	0.131	0.10	-0.03	0.23
Satisfaction Slider	2.52	2.29	1.10	0.272	0.07	-0.06	0.20
Positive Affect	0.12	0.15	0.79	0.428	0.05	-0.08	0.18
Negative Affect	-0.02	0.13	-0.13	0.895	-0.01	-0.14	0.12
Life Satisfaction	0.06	0.13	0.42	0.673	0.03	-0.10	0.16
Indebted	0.41	0.18	2.29	0.023	0.15	0.02	0.27
Elevation	0.36	0.15	2.36	0.019	0.16	0.03	0.28
Connection	-0.03	0.08	-0.41	0.685	-0.03	-0.16	0.10
Relationship Closeness	-0.18	0.19	-0.95	0.346	-0.06	-0.19	0.07

Hypothesized condition dummy codes predicting targets' T₃ scores, controlling for T₁ scores. CI = confidence interval; LL = lower limit; UL = upper limit.

Overall, the benefits of (parent) targets receiving gratitude appeared to be fewer than those of (student) actors sharing (i.e., with actors demonstrating 7 statistically significant effects on outcomes, and targets showing only 3 such effects). However, the strength of significant effects for actors and targets were comparable (average partial *r*s=.14 to .15).

Study 2

Study 1 examined two of the three primary roles posited by the Actor-Target-Witness framework – actors and targets. In Study 2, we turned our attention to witnesses. Specifically, this study aimed to further unpack the social nature of gratitude by examining the effects of observing gratitude exchanges on witnesses. We recruited adolescents (i.e., witnesses) from a large high school for a single time point pretest and posttest study. Adolescents were randomly assigned to read one of three types of letters from a hypothetical peer addressed to a parent, teacher, or friend. These letters varied as to whether they (1) described gratitude for kind acts received (e.g., for support during a challenging time), (2) described positive news (e.g., winning a basketball game), or (3) described a series of neutral events (e.g., going to school). In line with our overarching aim to examine the effects of gratitude within social networks, we focused in this study on one final research question: What is the impact of witnessing gratitude relative to neutral or positive news? In other words, Study 1 found that actors

and targets within gratitude exchanges experience benefits. Do witnesses also experience benefits as well?

We pre-registered our hypotheses for this study on the OSF. Pre-registration, data, materials, and R code are available for Study 2 at <https://osf.io/xj6s9>.

Hypotheses.

Witnesses.

We tested the following hypotheses for adolescent witnesses.

Hypothesis 6. Relative to those reading positive or neutral letters, adolescents who read gratitude letters will experience greater improvements in state gratitude, subjective well-being, elevation, and connection.

Hypothesis 7. Increases in elevation will mediate the effects of reading gratitude letters on well-being outcomes.

Method.

Participants.

Witnesses. We recruited adolescents ($N=267$; $M_{age}=15.98$; $SD=1.16$; 51.5% female) from a public high school in Orange County, Florida. We aimed to recruit 100 participants per condition for witnesses ($N=300$; Vazire, 2014). We succeeded in recruiting 294 witnesses, but our exclusion criteria reduced our N to 267. Students were enrolled in the 9th (24.6%), 10th (28.8%), 11th (26.2%), and 12th (20.4%) grades. Their ethnicities were

Hispanic (54.5%), White (32%), Asian (7.1%), Black (3.8%), and multiple races (2.6%). Most students spoke English at home (53%), but some spoke Spanish (39.5%) or another language (7.5%). Many of the students were enrolled in a variety of special programs, such as Free or Reduced Price Lunch (38.3%), English Language Learner (9.8%), Individualized Education Program (10.9%), and Exceptional Student Education (10.9%). In accordance with our pre-registered exclusion criterion, adolescents were excluded from analyses if they reported they put no effort into reading their assigned letters (27 excluded).

Procedure.

Study 2 was conducted in partnership with the Character Lab Research Network, who selected a partner high school, recruited participants, and oversaw study administration and data collection. The adolescent students were given 25 minutes of in-class time to complete the study. Those who completed the study in less than 25 minutes were automatically redirected to a benign behavioral task (e.g., completing math problems) to ensure all adolescents remained focused on an activity during the designated testing period.

During the 25-minute class period, adolescents logged-in to an online survey with a pretest, experimental manipulation, and posttest all occurring within a single session. Upon logging-in, adolescents were randomly assigned to one of three conditions: (1) read gratitude letters (Gratitude; $n=87$); (2) read positive letters (Positive; $n=90$), or (3) read neutral letters (Neutral; $n=90$). They completed some pretest measures, then read three letters from their assigned condition.

Adolescents in the Gratitude group read three letters thanking someone for kind acts (e.g., fixing a problem). Adolescents in the Positive control read letters relaying positive events or news (e.g., getting a good test grade). Finally, adolescents in the Neutral control read letters describing neutral experiences that happened during the week (e.g., going to the gym). All the letters were written by a hypothetical peer and addressed to a parent, teacher, or friend. These letter stimuli were developed using actual gratitude and control letters obtained from previous studies (Study 1; Armenta et al., 2020; Fritz et al., 2019) as models to create similar, realistic letters. Each condition contained a set of 10 letters, and adolescents were randomly presented with three of the 10 letters in their condition set. See Supplemental Materials for example, condition letters. Immediately after reading the letters, adolescents completed posttest measures.

Measures.

Witnesses completed the same outcome measures as actors and targets in Study 1, with a few small changes. Because participants were completing the same scales twice in one session, we shortened measures where possible to reduce participant fatigue. Study 2 measures thus included the following: 6-item GQ-6 ($\omega_s=.81-.82$); AAS with three additional low arousal items validated in previous research (e.g., 'relaxed/calm,' 'dull/bored'; Shin et al., 2021); 6-item positive affect $\omega_s=.87-.92$; 6-item negative affect $\omega_s=.83-.88$); a single-item from the Monitoring the Future Study ('How satisfied are you with your life as a whole these days?'; Johnston et al., 2017); 6-item elevation ($\omega_s=.76-.84$); and a shorter 3-item version of the relatedness subscale of the BMPN ($\omega_s=.83-.90$). See Supplemental Materials for additional Study 1 and Study 2 measures not reported here.

Results.

Witnesses.

Hypothesis 6. Effect of Witnesses Observing Gratitude. To test our sixth hypothesis, we again ran regressed (i.e., residualized) change models, this time predicting posttest scores from condition dummy codes, controlling for pretest scores (see Table 3). We dummy coded condition with the Positive and Neutral control condition(s) as the reference group to compare: (1) Gratitude vs. Positive, (2) Gratitude vs. Neutral, and (3) Gratitude vs. both controls (Positive and Neutral). See Supplemental Materials for witness means (Table S7), bivariate correlations (Table S8), and ITT analyses (Table S9).

Gratitude group vs. neutral control. Gratitude vs. Neutral regressed change analyses indicated that adolescents who read gratitude letters reported significantly greater improvements in positive affect (partial $r=.24$, $p=.002$) and elevation (partial $r=.24$, $p=.001$), relative to those who read neutral letters. However, we found no significant differences between the Gratitude and Neutral groups for state gratitude (partial $r=-.12$, $p=.107$), negative affect (partial $r=-.10$, $p=.172$), life satisfaction (partial $r=-.09$, $p=.255$), or connection (partial $r=.02$, $p=.744$).

Gratitude group vs. positive control. When comparing the gratitude group to the positive control, we found no significant differences for state gratitude (partial $r=-.14$, $p=.058$), positive affect (partial $r=.02$, $p=.817$), negative affect (partial $r=.04$, $p=.598$), life satisfaction (partial $r=-.03$, $p=.727$), elevation (partial $r=.01$, $p=.89$), and connection (partial $r=.02$, $p=.772$).

Table 3. Study 2 witness regressed change models.

Variable	<i>b</i>	<i>b SE</i>	<i>t</i>	<i>p</i>	Partial <i>r</i>	Partial <i>r</i> 95% CI LL	Partial <i>r</i> 95% CI UL
Gratitude vs. Neutral:							
Gratitude	-0.14	0.08	-1.62	0.107	-0.12	-0.26	0.03
Positive Affect	0.43	0.13	3.22	0.002	0.24	0.09	0.37
Negative Affect	-0.17	0.12	-1.37	0.172	-0.10	-0.25	0.05
Life Satisfaction	-0.17	0.15	-1.14	0.255	-0.09	-0.23	0.06
Elevation	0.47	0.14	3.24	0.001	0.24	0.10	0.37
Connection	0.02	0.07	0.33	0.744	0.02	-0.12	0.17
Gratitude vs. Positive:							
Gratitude	-0.15	0.08	-1.90	0.058	-0.14	-0.28	0.01
Positive Affect	0.03	0.14	0.23	0.817	0.02	-0.13	0.17
Negative Affect	0.07	0.12	0.53	0.598	0.04	-0.11	0.19
Life Satisfaction	-0.05	0.14	-0.35	0.727	-0.03	-0.17	0.12
Elevation	0.02	0.14	0.14	0.890	0.01	-0.14	0.16
Connection	0.02	0.07	0.29	0.772	0.02	-0.13	0.17
Gratitude vs. Both Controls:							
Gratitude	-0.15	0.07	-2.05	0.042	-0.12	-0.24	0.00
Positive Affect	0.23	0.13	1.83	0.068	0.11	-0.01	0.23
Negative Affect	-0.05	0.11	-0.46	0.644	-0.03	-0.15	0.09
Life Satisfaction	-0.11	0.13	-0.83	0.407	-0.05	-0.17	0.07
Elevation	0.24	0.13	1.91	0.057	0.12	0.00	0.23
Connection	0.02	0.06	0.37	0.712	0.02	-0.10	0.14

Hypothesis 6. Hypothesized condition dummy codes predicting witnesses' posttest scores, controlling for pretest scores. CI = confidence interval; LL = lower limit; UL = upper limit.

Gratitude group vs. both controls. Contrary to our prediction, those who read gratitude letters reported significant *decreases* in state gratitude (partial $r = -.12$, $p = .042$), relative to both the positive and neutral controls. However, we found no significant differences between the gratitude group and controls for positive affect (partial $r = .11$, $p = .068$), negative affect (partial $r = -.03$, $p = .644$), life satisfaction (partial $r = -.05$, $p = .407$), elevation (partial $r = .12$, $p = .057$), and connection (partial $r = .02$, $p = .712$).

Hypothesis 7. Increases in Elevation Mediate Effects on Well-Being. We also explored whether witnessing gratitude led to relatively greater positive affect (PA) and life satisfaction (LS) via increases in elevation over time. Witnessing gratitude (i.e., a dummy coded grouping variable comparing those who read gratitude letters to those who read neutral letters) predicted greater elevation throughout the study (PA & LS: a path; $b = 0.48$, $p = .002$; see Figure 3) and elevation predicted greater positive affect and life satisfaction at posttest (PA: b path; $b = 0.23$, $p = .03$; LS: $b = 0.29$, $p = .011$). Percentile bootstrap confidence intervals showed significant indirect effects for well-being. Adolescents who witnessed gratitude reported greater elevation throughout the study, which was associated with higher positive affect and life satisfaction at posttest (PA: estimate = .11, 95% CI [0.01, 0.25]; LS: estimate = .14, 95% CI [0.04, 0.27]). For life satisfaction, because c and c' were not significant, as well as the opposite sign of the indirect (ab) effect, this may suggest the presence of inconsistent mediation, with elevation acting like a suppressor variable (MacKinnon et al., 2007).

Discussion.

In our second study, we found that witnesses prompted to observe gratitude (that is, to read gratitude letters) reported immediate boosts in positive affect and elevation (depending on whom we compared them to); surprisingly, however, they reported decreases in feelings of gratitude. The effects of reading gratitude letters on positive affect and elevation were small-to-moderate in size when compared to reading neutral letters (partial r s of .24), but substantially diminished when compared to reading positive (i.e., happy) letters (partial r s = .01 to .02). Finally, as predicted, we found evidence that witnessing gratitude led to increases in elevation (i.e., feeling moved and inspired), which in turn yielded greater positive affect and life satisfaction.

General discussion

In summary, our two studies aimed to test the Actor-Target-Witness framework, addressing the following questions. What is the impact of recalling gratitude and keeping it private versus sharing it with a benefactor? And, what is the impact of receiving and witnessing gratitude? To begin to answer these questions, we observed the following effects. First, *actors recalling* gratitude showed relative improvements in state gratitude, mood, and satisfaction (partial r s = .10 to .15). Second, *actors sharing* gratitude reported boosts in state gratitude and relationship closeness (partial r s = .13 to .19). Third, *targets receiving* gratitude demonstrated increases in state gratitude, indebtedness, and elevation (partial r s = .14 to .16). And, finally, *witnesses observing* gratitude

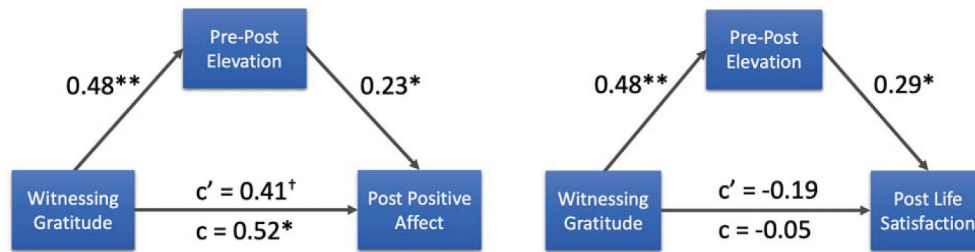


Figure 3. Study 2 elevation mediates changes in well-being. Hypothesis 7. The effect of witnessing gratitude on positive affect (left) and life satisfaction (right) at posttest via increased elevation. † $p \leq .10$. * $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

exchanges reported decreased state gratitude (partial $r = -.12$), but increased positive affect and elevation (partial $r_s = .24$).

The results presented here focus primarily on our studies' statistically significant effects ($ps < .05$), but we found a variety of marginal effects ($.1 < ps < .05$; see Tables 1–3 for all effects and exact p -values) that may replicate as significant in future studies with larger sample sizes. Overall, the effects observed in our studies were relatively small in size ($r_s < .30$), but comparable to those seen for actors in previous gratitude meta-analytic work (Davis et al., 2015). Moreover, even small effects can aggregate over time to meaningfully impact outcomes (Funder & Ozer, 2019).

Numerous empirical studies have demonstrated that gratitude interventions lead actors to feel grateful (Davis et al., 2015). However, to our knowledge, our studies are the first to provide evidence that the targets of gratitude also feel grateful, and that those witnessing gratitude can report feeling less grateful. Why might this be the case?

First, the boosts in state gratitude we observed in targets suggest 'a gratitude for gratitude' effect, indicating that the response to being thanked is to feel thankful. This is perhaps not surprising, given that gratitude is usually induced by kind acts, and prosocial behavior interventions directing participants to do kind acts for others often suggest writing a thank you note. Indeed, gratitude and kindness may represent two sides of the same coin. Our parent targets may have felt grateful that their child took the time to appreciate them. Previous research also suggests that the other-praising behavior inherent in gratitude expressions (e.g., 'You are an incredible person') makes targets feel more understood and valued (Algoe et al., 2016; Reis & Clark, 2013), which could further prompt grateful feelings.

Second, in the case of witnesses, reading peers' gratitude letters may have prompted social comparison or envy (e.g., 'I don't remember the last time someone

thanked me,' or 'Wow her dad is awesome, and my dad never does anything like this for me'), prompting witnesses to feel less grateful instead of more. Alternatively, exposure to moral exemplars (e.g., a parent going out of their way for their child) may sometimes make people feel worse about themselves (Han et al., 2017). Given that this finding was unexpected, however, more research is needed to replicate and unpack it. Further, the effects of witnessing gratitude may look different in 'live' encounters (as opposed to reading letters), especially when witnesses know the actor and target involved in the exchange. For example, watching one's parent express gratitude to a sibling could make a witness feel guilty, resentful, proud, or inadequate, depending on family dynamics.

Benefits versus costs of gratitude.

Studies 1 and 2 also showed that various gratitude roles and processes may come with varying benefits and costs. With regard to benefits, recalling, sharing, receiving, and witnessing gratitude provided a variety of hedonic rewards for actors, targets, and witnesses, such as improved mood, satisfaction, positive affect, and elevation. Some of these benefits, however, only emerged for one type of role. For example, only actors experienced improved relationship closeness – supporting Seligman's suggestion in *Flourish* that gratitude may strengthen social relationships.

Other benefits were robust across roles. For example, actors, targets, and witnesses all experienced increases in elevation, and, in Study 2, elevation even mediated increases in positive affect and life satisfaction among witnesses – suggesting that elevation may serve as a mechanism by which witnessing gratitude boosts well-being. In other words, witnesses who feel more elevated also feel happier. The prominent role that elevation revealed itself in our research is not surprising, given that no matter what vantage point individuals find themselves within a gratitude exchange, they are likely to feel inspired and moved by thinking about, communicating, accepting, or observing gratitude for a kind act. However, these different vantage points could produce

this state for somewhat different reasons. Actors may have felt elevated by recalling the generosity and support they have received; targets may have felt elevated because they received generous and grateful words; and witnesses may have felt elevated because they observed kindness as a goodness or virtue. Although all of these examples involved witnessing kindness (i.e., a virtuous act involving the welfare of another), future research is needed to examine how and why these processes are similar and where they diverge.

Regarding costs, in Study 1, targets receiving gratitude experienced increases in indebtedness, which may sometimes feel somewhat unpleasant and uncomfortable. However, past research suggests that the indebtedness prompted by gratitude moves one to improve themselves as a person (e.g., work harder, eat healthier, be kinder; Armenta et al., 2020). Thus, it is not clear whether our target participants' reports of indebtedness represent a cost or (hidden) benefit.

In Study 2, witnesses also appeared to experience a cost from observing gratitude exchanges – namely, drops in feeling grateful. Again, this effect may have been due to social comparison processes. Future investigators could assess whether witnesses engage in social comparison when beholding gratitude, and whether (and how) this effect negatively impacts well-being outcomes.

The role of social connection.

Importantly, across studies and participants, positive social controls (e.g., writing a letter about one's activities at college to a parent, reading a letter from a peer relating positive news) often elicited similar effects as gratitude. When it came to actors, some of the biggest effects we found involved comparing sharing something (versus not sharing), indicating that it is social connection that matters, not what is being shared. When it came to witnesses, reading about gratitude produced more positive affect and elevation relative to reading something neutral, but not relative to reading about good news.

In sum, in line with findings from other research from our laboratory and others (Epley & Schroeder, 2014; Fritz et al., 2021; Margolis & Lyubomirsky, 2020; Sandstrom & Dunn, 2014), the results of our two studies here suggest that it may not specifically be gratitude or even kindness that facilitate greater well-being; rather, it is positive social interactions that matter. For example, in multiple studies, undergraduate students assigned to act extraverted (Margolis & Lyubomirsky, 2020), commuters on a train directed to talk to strangers (Epley & Schroeder, 2014), and Starbucks customers assigned to chat with a barista (Sandstrom & Dunn, 2014) reported relatively

greater positive affect and other well-being-related outcomes. Ultimately, social connection may be the critical ingredient underlying the success of gratitude interventions.

Limitations and future directions

Methodological issues.

Several limitations of our research could be addressed in future studies. Although our samples sizes were relatively large ($Ns \geq 247$; an average of ~80 participants per condition) – approaching or exceeding $N = 250$, which Monte Carlo simulations suggest yield more stable estimates (Funder & Ozer, 2019) – the effects of gratitude tend to be relatively small ($ds = .17$ to $.30$; $\sim rs = .08$ to $.15$; Davis et al., 2015). Thus, even larger sample sizes (e.g., ~100-500 per condition) would likely be ideal for achieving greater statistical power and more robust effect size estimates. Furthermore, our studies represent merely an initial test of our theoretical framework. Replication studies are sorely needed to determine the replicability of the effects described here.

The role of moderators and mediators.

Future research testing potential moderators of these effects would be highly informative. Our participants were characterized by a diverse range of ages (14 to 72), ethnicities (predominantly Hispanic, Asian, and White), languages (English, Spanish, other), and education levels (from currently in high school to having completed graduate work). However, all those sampled came from the U.S., a predominantly Western, educated, industrialized, rich, and democratic culture, which does not represent the totality of human experience (Jones, 2010). A number of potential moderating variables (e.g., gender, age, culture, relationship-type) could attenuate or amplify effects. For example, Study 1 recruited a large proportion of female actor and target participants. As such, we could have observed relatively smaller increases in state gratitude due to ceiling effects, as women tend to report greater trait gratitude than men (Jans-Beken et al., Jans-Beken, et al., 2018).

As another example, members of different cultures may be more or less comfortable with practicing gratitude, which will likely impact its effects on actors, targets, and witnesses. One study found that college students (actors) recalling gratitude in South Korea experienced fewer well-being benefits than did students in the U.S. (Layous et al., 2013; see also Shin et al., 2020). Future studies could continue to investigate whether the costs and benefits of recalling, sharing, and witnessing gratitude vary in different cultures and subcultures.

Additionally, our sample of actors and targets in Study 1 focused on a single type of social relationship – child and parent. Many gratitude letters are often addressed to parents, which made child-parent dyads an optimal relationship to study. However, future research could explore whether effects vary by relationship-type (e.g., child-parent, friends, romantic partners, siblings, roommates, co-workers). Future investigators may also wish to explore and compare different methods of sharing gratitude – for example, in person versus via electronic or computer-mediated forms of communication, such as video conferencing and text.

Gratitude science would also benefit if future work further examined the mechanisms (or mediators) by which recalling, sharing, receiving, and witnessing gratitude influence well-being and related outcomes. Studies 1 and 2 revealed different well-being benefits (or costs) for different roles and processes, but more needs to be known to account for these effects. Furthermore, Study 2 showed that elevation mediated increases in well-being for witnesses, and previous research has shown elevation also to mediate increases in well-being for actors (Armenta et al., 2020). Is elevation a critical mechanism to explain why targets of gratitude benefit in well-being as well? Other possible questions that remain to be tested include whether targets of gratitude might feel awkward during gratitude exchanges, but not witnesses, or whether actors feel indebted, but not targets.

Proximal versus distal effects.

The design of Study 1 was especially challenging, as it required coordinating the logistics of accurately assessing both actors and targets as they progressed through the various elements of the gratitude exchange. Although we believe this study design presented an innovative way to disentangle recalling, sharing, and receiving gratitude outside of the laboratory, future studies may improve on it. Fortunately, we were able to assess the proximal effects of recalling gratitude (i.e., measuring the immediate effects of letter writing on students) in Study 1, as well as the proximal effects of witnessing gratitude (i.e., measuring the immediate effects after adolescents read gratitude letters) in Study 2. However, in Study 1, we were only able to assess the distal effects of sharing gratitude for actors and receiving gratitude for targets (with shared interactions occurring 1 to 7 days prior to the T₃ assessments). We may have observed even stronger effects of sharing and receiving gratitude had we been able to measure them more immediately.

Measuring social connection.

We have pointed to the role of social connection as a key mechanism underpinning gratitude interventions, but a careful reader may have noticed that none of our gratitude manipulations for actors, targets, or witnesses actually induced greater feelings of connection. This may be due to limitations surrounding the connection measure we used, which asks participants to rate their agreement with statements items like, ‘I feel close and connected with other people who are important to me’ (Sheldon & Hilpert, 2012). However, instead of increasing general feelings of connection with multiple people in one’s life, recalling or sharing gratitude may only boost feelings of connection with a specific person (the gratitude target). We have recently developed a new measure to better assess the specific feelings of connection felt during a particular social interaction, such as an exchange of gratitude or kindness (Okabe-Miyamoto et al., 2021). This and other measures of connection, such as the recently developed positivity resonance scale (Major et al., 2018) from Fredrickson’s laboratory, may be suitable in future studies of gratitude exchanges.

Recalling and sharing gratitude in naturalistic settings.

Our proposed framework may be most relevant to understanding gratitude interventions or situations in which gratitude is prompted or experienced after-the-fact (e.g., when recalling a past generosity). However, in naturalistic settings, gratitude is often experienced in the moment, when an actor notices someone has done something for them for which they feel immediately grateful (e.g., a colleague brings them coffee). Sharing gratitude requires noticing (or recalling) that there is something to be grateful about. However, future studies may find that sharing gratitude may have broader and larger effects because sharing requires relatively more time with gratitude (i.e., not just recalling it, but also sharing it). Thus, retrospective gratitude (as studied here) may differ from immediate gratitude as it occurs in real life. Future studies could also examine whether our framework explains in-the-moment gratitude to the same extent as prompted or after-the-fact gratitude.

Applying the actor-target-witness framework in new contexts.

In the future, our theoretical framework could be used to understand and explore processes and roles inherent in other positive activity interventions. For example, when participants (i.e., actors) are directed to perform acts of kindness for others, in addition to assessing effects on actors, researchers could also assess the effects of receiving kindness on targets, as well as the

effects of observing kindness on witnesses (see one study that attempted this approach; Chancellor et al., 2018). The Actor-Target-Witness framework could also be applied to other interventions (e.g., acting more social, writing forgiveness letters, reducing prejudice, bolstering academic self-efficacy, etc.). Overall, the studies presented here point to the importance of exploring the well-being costs and benefits of the different roles (actors, targets, witnesses) involved in gratitude exchanges, but our manipulations were relatively narrow and brief and examined effects separately for each type of participant. In the future, it would be exciting to further investigate the dynamic and recursive effects – at both the dyadic and group level – on the well-being of the different roles involved in gratitude, kindness, social engagement, and other interventions on well-being.

Conclusion

Gratitude has been ubiquitous in human societies across centuries and contexts, extolled as an indispensable virtue and an essential ingredient for a life well-lived. Accordingly, gratitude science promises not only to elucidate human nature but to help humans flourish. Naturally, it was Martin E. P. Seligman's extraordinary body of work that planted the seeds for this project exploring gratitude exchanges in a social context. Our two studies provide evidence that sharing gratitude may provide different benefits for actors than merely recalling it, and that the targets and witnesses of gratitude may garner well-being benefits as well. Notably, quotidian gratitude exchanges usually require at least two people – one person to say, 'Thank you,' and another to say, 'You're welcome.' Sometimes a third person watches this process unfold. Yet much of gratitude research has focused primarily on only one part of this social exchange (actors). An overarching theme of well-being science acknowledges that social ties are key to well-being. As such, it makes sense that gratitude – and other interpersonal exchanges – would have well-being implications for more than a single person.




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Data availability statement

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