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Positive Psychology in Context: Effects of Expressing Gratitude in Ongoing Relationships Depend on Perceptions of Enactor Responsiveness

Sara B. Algoe and

University of North Carolina at Chapel Hill

Ruixue Zhaoyang

University of Missouri-Columbia

Abstract

Recent correlational evidence implicates gratitude in personal and relational growth, for both members of ongoing relationships. From these observations, it would be tempting to prescribe interpersonal gratitude exercises to improve relationships. In this experiment, couples were randomly assigned to express gratitude over a month, or to a relationally-active control condition. Results showed modest effects of condition on personal and relational well-being. However, those whose partners were perceived as being particularly responsive when expressing gratitude at the initial lab session showed greater well-being across a range of outcomes, whereas this was not so for people in the control condition. Notably, evidence raises concerns about the effectiveness of artificial injections of gratitude when the partner is perceived to be low in responsiveness. Given the importance of close relationships, this work highlights the need for more theory-driven basic research tested in context before assuming what appears to work naturally will also work artificially.

Keywords

gratitude; interpersonal relationships; positive emotions; romantic partners; expressed gratitude; ongoing relationships

Recent evidence for the role of the emotion of gratitude in social life strongly implicates it in the promotion of dyadic relationships (see review in Algoe, 2012). Though mostly correlational, this promising evidence naturally prompts the question: can we improve relationships by injecting more gratitude? Testing this question within established dyads would address theory regarding the causal role of gratitude in relationship promotion. Simultaneously, if the answer is “yes”, such an apparently simple solution for improving relationships would have widespread practical implications. This includes the obvious potential for applications to everyday relationship functioning as well as for couples seeking relationship therapy. In fact, given the robust associations between high quality relationships

and mental and physical health (e.g., Holt-Lunstad, Smith, & Layton, 2010), benefits could even extend out as far as health care costs.

Of course, this is jumping way too far ahead. The only way to know whether injecting more gratitude into relationships will improve them is to use an experimental design involving both members of the couple, tracked over time. Though it may seem unnecessary in light of the rapidly accumulating prospective evidence regarding gratitude in relationships (e.g., Algoe, Fredrickson, & Gable, 2013; Gordon, Impett, Kogan, Oveis, & Keltner, 2012; Kubacka, Finkenauer, Rusbult, & Keijsers, 2011), below, we argue that this experiment is urgently needed now, close on the heels of the correlational findings.

In fact, a key insight from recent theorizing about gratitude is that it functions as part of a dynamic *interpersonal process* between a grateful person and his or her benefactor (Algoe, 2012). This suggests that it is incumbent on researchers to incorporate both members of the dyad, in part to be able to focus on a key aspect of the interpersonal process through which one person's gratitude may impact the other person's outcomes. Specifically, recent evidence suggests that *the way a partner perceives the behavior* may be an important boundary condition for the utility of artificially injecting gratitude into an ongoing dyadic relationship (e.g., Algoe et al., 2013). To test this, the current one-month experiment employs the "grateful behavior" of expressed gratitude, and measures the partner's perception of the behavior the first time it is enacted. Finally, this experiment tests a previously unaddressed aspect of theorizing about the adaptive value of the emotion of gratitude, namely that, in addition to *interpersonal* benefits, accumulated instances of gratitude should bring *intrapersonal* benefits; here, we focus on everyday resilience and satisfaction with life.

Gratitude in Relationships

Gratitude is a positively-valenced emotion that may (or may not) arise when one person – a benefactor – provides a benefit to another (a recipient).¹ Although for several decades the primary social function of gratitude has been thought to encourage the recipient to repay the benefactor (see review in McCullough et al., 2001), in just the past handful of years, evidence has been rapidly accumulating to show that the effects of gratitude go beyond reciprocity (e.g., Algoe et al., 2008). Specifically, several correlational studies involving each member of ongoing relationships now document that one person's experienced gratitude has implications for the quality of the relationship, as reported either by the grateful person or independently by the benefactor toward whom she or he is grateful (Algoe, Haidt, & Gable, 2008; Algoe, Gable, & Maisel, 2010; Gordon et al., 2012; Kubacka et al., 2011). This evidence has led to an updated perspective on the social functions of gratitude: in the moments gratitude is experienced, this emotion serves to draw attention to someone who would make a high-quality relationship partner – that is, by either *finding* or *reminding* of the person's potential -- and simultaneously coordinates mind, body, and

¹There is also a substantial body of literature on a broader conceptualization of gratitude as an orientation toward life or, as Lambert, Graham, & Fincham (2009) called it, "generalized gratitude". Instead, as indicated, the current investigation draws its hypotheses from well-specified theory about gratitude as a positively-valenced emotion (see Algoe, 2012; Fredrickson, 1998).

behavior to help *bind* the grateful person more closely into the relationship with that person (Algoe, 2012).

One of the most complex sets of empirical questions remaining from the *find*, *remind*, and *bind* theory is about *how* one person's gratitude may draw a benefactor in to the relationship: how could one person's experienced emotion fuel an upward spiral of relational growth for each member of the dyad? In the current work, we focus on the role of expressed gratitude.

The promise of behaviorally expressed gratitude for beneficial relationship outcomes

To date, some evidence suggests that, for the grateful person, expressing gratitude can bring relational consequences (Algoe & Stanton, 2012; Lambert & Fincham, 2011; Lambert, Clark, Durtschi, Fincham, & Graham, 2010). For example, in a sample of women with metastatic breast cancer, experienced gratitude was only positively associated with change in perceived social support over a three month period to the extent that women were characteristically unambivalent about expressing their emotions (Algoe & Stanton, 2012).

But does a grateful person's expression matter for the target of the expression, that is, the original benefactor?² Several early experiments show one way in which it can: expressed gratitude (vs. no expression) increases the target's positive behavior back toward the expresser (Clark, Northrop, & Barkshire, 1988; Crano & Sivacek, 1982; Goldman, Seever, & Seever, 1982; Grant & Gino, 2010; Rind & Bordia, 1995). This general effect has been called a "behavioral reinforcer" function of gratitude (McCullough et al., 2001). Yet beyond operant conditioning of helpful actions, the *find*, *remind*, and *bind* theory of gratitude asserts that an expression of gratitude likely has an acute *psychological* effect on the person who is its target. In turn, this beneficial psychological effect is theorized to contribute to improvements in the target's own perspective about the quality of the relationship with the grateful person. As such, the grateful person's expression and the momentary psychological effect of the expression on the target are two important parts of an interpersonal process through which gratitude can promote relationship quality, for each member of the pair (Algoe, 2012).

One recent study begins to address this possibility by using a longitudinal design and the participation of couples in romantic relationships (Algoe, et al., 2013). First, in the lab, researchers asked couples to have face-to-face conversations in which one couple-member expressed gratitude to the other. The logic of the study design follows the logic of prior observational paradigms that use a live interaction between couple-members within the lab setting as a representative sample of how couples might tend to have that type of interaction in everyday life (e.g., Collins & Feeney, 2000; Driver & Gottman, 2004; Gable, Gonzaga, & Strachman, 2006; Gottman, Coan, Carrere, & Swanson, 1998). To test the specific hypotheses about the impact of one person's gratitude on target of the expression, after

²We use the term "target of the expression" in the tradition of the person perception literature. Though some have suggested using "recipient of the expression" because it has a softer tone, throughout the gratitude literature, the term "recipient" is used to refer to the person who originally felt gratitude (i.e., after *receiving* a benefit from someone else). Given the focus of the present research on distinguishing roles of each dyad member in this interpersonal process, it is appropriate to use distinct labels for each person. As such, the original benefactor can become the "target" of an expressive response by a person who was originally grateful for the person's actions.

hearing an expression of gratitude for their own actions, targets reported on the psychological impact of the interaction. Specifically, because perceived partner responsiveness is the relational currency through which gratitude (and its expression) are hypothesized to function (see Algoe, 2012), targets rated the extent to which the expresser was perceived to be responsive during that interaction -- that is, they rated how understanding, validating, and caring the expresser was. Six months later, targets reported their satisfaction with the relationship. Consistent with predictions, those who perceived their partners to be responsive when expressing gratitude had greater change in relationship satisfaction six months later, taking into account initial relationship satisfaction.

Critically, the *find-remind-and-bind* theory focus on perceived partner responsiveness as an outcome of gratitude interactions builds on a rich history of theory regarding relationship behaviors and their implications for relationship quality (see Reis, Clark, & Holmes, 2004). Perceived partner responsiveness was first documented as a core underlying feature of intimacy following self-disclosure, broadly defined (Reis & Shaver, 1988; Laurenceau, Barrett, & Pietromonaco, 1998). More recently, Gable and colleagues demonstrated that perceived partner responsiveness after the partner responded to two different types of self-disclosure in the lab -- about a negative event or about a positive event -- independently predicted relationship well-being for couple-members (Gable et al., 2006). In short, there are many types of everyday couple interactions that are important for relationship quality, via perceived responsiveness. The *find, remind, and bind* theory calls out a particularly direct role for gratitude and its expression in relationship growth (Algoe, 2012). So, in the study just discussed (Algoe et al., 2013), in addition to expressions of gratitude, couples also had a chance to respond to the partner's disclosure of negative and positive events in the lab, in separate interactions. Results documented that, even controlling for the significant associations between perceived partner responsiveness of those additional enacted behaviors and relationship satisfaction, perceived responsiveness of the partner expressing gratitude robustly predicted change in relationship satisfaction for the target of the expression (2013). Altogether, these prospective findings raise the intriguing possibilities that expressions of gratitude play an important, unique, and causal role in improving the quality of ongoing relationships.

Effects on target may depend on characteristic perceptions of enactor's behavior

However, before rushing to recommend that expressions of gratitude be incorporated into therapy for couples, we draw attention to an important caveat of this recent work: all participants believed they were expressing gratitude to their partner, yet only some expressions best hit the mark to predict subsequent change in relationship quality (Algoe et al., 2013). Specifically, people who perceived more responsiveness in this particular behavior of the expresser were the ones likely to have better relationships six months later. If true, this suggests that effectiveness of an attempt to causally change long-term outcomes by increasing expressed gratitude will depend on the degree to which the target of the expression perceives the expresser as being responsive. Moreover, in that study, couples had been together for an average of about four years (minimum, 6 months) and, as in prior research (e.g., Gable et al., 2006; Gottman et al., 1998), it is likely that the target's initial

perception of the behavior may be used as a gauge to identify who is most likely to benefit from incorporating gratitude expressions into the relationship routine.

Beyond the Relationship: Gratitude and Personal Well-Being

Finally, though much research on the emotion of gratitude has focused on relational consequences, there is good reason to test personal consequences as well. For theoretical reasons, this is especially true because gratitude is a positively-valenced emotion; as such, through repeated instances, Fredrickson's broaden-and-build theory of positive emotions suggests gratitude – and by extension, its expression -- may help build a variety of resources that could be drawn upon in future times of need (see Fredrickson, 1998; 2004). For example, prior work shows that accumulated positive emotions are associated with an intrapersonal resource of ego-resilience, or the ability to adapt in the face of challenge (e.g., Catalino & Fredrickson, 2011; Fredrickson, Tugade, Waugh, & Larkin, 2003), as well as the intrapersonal mental health outcome of satisfaction with life (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008).³ Moreover, feeling valued and cared for by another person is likely to increase the sense that one has the resources to cope with stressors and even promote personal growth (see attachment theory, e.g., Cassidy, Shaver, Mikulincer, & Levy, 2009; Feeney & Van Vleet, 2010). In the current study, we thus test unaddressed predictions from theory about the emotion of gratitude by exploring the possibility that expressed gratitude is associated with consequential intrapersonal outcomes for each member of the pair, alongside the expected influence on relationship quality that has been the focus of prior research (e.g., Algoe et al., 2013).

The Current Research

The current experiment tests what would seem to be a straightforward question: Does expressing gratitude improve relational and personal well-being? However, unlike previous experiments on expressed gratitude (e.g., Lambert et al., 2010), we adopt a whole-dyad perspective, incorporating both members of the pair. Including both members of the pair is worthwhile because emotions are most often experienced and expressed within the context of ongoing interpersonal relationships (Reis, Collins, & Berscheid, 2000), and the emotion of gratitude in particular is thought to bring benefits to each member of a dyad (Algoe, 2012). Moreover, given recent evidence for the benefits of expressed gratitude for relationships (e.g., Algoe et al., 2013; Lambert et al., 2010; Lambert & Fincham, 2011) coupled with widespread enthusiasm for implementing positive psychology behaviors in general (e.g., American Psychologist Special Issue, 2011) as well as recent researcher and practitioner interest in gratitude in particular (e.g., Expanding the Science and Practice of Gratitude, 2015), data regarding critical hypothesis tests of the added value (or detriment) of

³Interestingly, this latter outcome has also been documented for people assigned to express gratitude within a written letter for each of six weeks, but – in contrast to the focus of the current investigation on social interaction - the letter-writers knew they would not send the letters (p. 395; Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011). Moreover, a large body of evidence from research on the *grateful disposition* -- which is a more broadly defined construct than the emotion of gratitude under consideration here but should, in theory, include moments of gratitude experienced (and expressed) because of another person's actions – documents many links between gratitude and mental health outcomes (see review in Wood, Froh, & Geraghty, 2010). Intrapersonal outcome measures have not made it to the emotion-based literature on gratitude, where gratitude is defined as a momentary affective experience caused by another person's actions. In the current work, we thus test unaddressed predictions from emotion theory while simultaneously building bridges to this related gratitude literature, a point to which we return in the discussion.

injecting gratitude expressions into one's relationship compared to another well-established relationship behavior is useful: Is it worth the time and effort? Were prior findings due to the fact that people who were already in good relationships perceived their partners as better expressers? Are there any downsides? This final question is particularly important, given the well-documented role of relationship quality in mental and physical health, and even longevity (e.g., Holt-Lunstad, Smith, & Layton, 2010, as well as Finkel, Eastwick, Karney, Reis, & Sprecher, 2012, for a similar point.)

In this one-month experiment, we randomly assign couples to more frequently enact one potentially "relationship-enhancing" behavior toward one another over the course of one month: express gratitude or respond to the partner's self-disclosure. There was no inactive control condition, making this a conservative test of the hypotheses. The self-disclosure conversation serves as an appropriate active control condition for this first large-scale evaluation of the positive psychological construct of expressed gratitude for several reasons. First, it was one of the first to be theoretically and empirically established as having the potential to promote a relationship through the discloser's *perception of the partner's responsiveness* (i.e., Laurenceau, Barrett, & Pietromonaco, 1998; Manne, Ostroff, Rini, Fox, Goldstein, & Grana, 2004; Reis & Shaver, 1988). However, we believed it would be emotionally neutral in valence. So for the main-effect question of whether adding the positive emotional conversation of expressing gratitude to the relationship routine would bring benefits for each member of the pair, this control condition should be relationally active and would rule out the alternative explanation that merely having an intimacy-generating conversation several times over the course of a month is good for the self and relationship.

Importantly, there is added value in relying on this well-established relationship behavior as an initial active control condition: the relationship behavior of *responding to a self-disclosure* was one of the first used to illuminate the role of perceived partner responsiveness in generating intimacy (Reis & Shaver, 1988). Empirically, for example, two studies demonstrated that perceived partner responsiveness accounted for positive associations between self-reported self-disclosure to a social interaction partner and post-interaction feelings of intimacy with that (responsive) partner (Laurenceau, Barrett, & Pietromonaco, 1998; Manne, Ostroff, Rini, Fox, Goldstein, & Grana, 2004). Thus, in each condition of the current study, one member of any given conversation has the role of *enacting* the proposed relationship-enhancing behavior (i.e., either expressing gratitude or responding to a self-disclosure), and the other member's *perception* of the enactor's responsiveness when enacting that behavior has been previously associated with relationship outcomes for the perceiver (i.e., perceived responsiveness of expressed gratitude; Algoe et al., 2013; perceived responsiveness of responding to a self-disclosure, Laurenceau, Barrett, & Pietromonaco, 1998; Manne, Ostroff, Rini, Fox, Goldstein, & Grana, 2004). These facts make it a strong comparison condition. Prior work using an observational design has demonstrated that the perception of a partner's responsiveness after expressing gratitude is associated with future satisfaction *independent* of perception of responsiveness after the same person enacted other relationship behaviors in the lab (Algoe et al., 2013). Our current between-subjects design allows us to move beyond statistical independence: We test whether the effect is *greater* in one condition than the other.

- H1** Incorporating expressed gratitude conversations into the relationship routine, compared with incorporating self-disclosure conversations, will cause beneficial personal and relational outcomes.
- H2** The effect of condition on personal and relational outcomes will be moderated by individual differences in perceptions of the partner's enacted relationship behavior.

Most critical for future research and application, support for a moderated effect would document the dependent nature of artificially increasing expressed gratitude on *perceptions*, as predicted by theory on interpersonal processes (e.g., Reis & Shaver, 1988). In addition, it would replicate and extend prior research regarding the unique predictive power of perceived responsiveness following a gratitude expression (Algoe et al., 2013) for beneficial interpersonal as well as intrapersonal outcomes.

Method

Participants

The study was advertised via e-mail sent to staff at the University of North Carolina at Chapel Hill and craigslist.org. Participants were eligible if they were at least 24 years old, not taking antidepressants or been recently diagnosed with depression or an anxiety disorder; women were ineligible if they were over 40, postmenopausal, pregnant (or planning to become pregnant during the study), within six months postpartum (lactating), or have had an oophorectomy; men were ineligible if they were taking steroid medication.⁴

The 106 members of 53 heterosexual cohabiting couples who were eligible and attended an initial lab session were primarily in married relationships at study entry (58.0%), whereas 11% of couples were engaged and 27% were exclusively dating. Additional demographic information was obtained from those who completed the study. Participants were, on average, 29 years old ($Mdn = 28$; range = 23 to 53), and had been romantically involved for just over five years ($M = 5.41$ yr; $Mdn = 4.75$ yr; range = 1 to 15 yr.). The majority of participants self-identified as White/Caucasian (77.9%), and the remaining participants were Black/African-American (10.5%), East or South Asian (5.8%), and American Native or Pacific Islander (5.8%).

Procedure

Prior to attending a lab session, participants independently completed online questionnaires about the relationship. Upon arrival to the initial lab session, couples in this experiment were randomly assigned to the expressed gratitude or the active control condition (i.e., responding to a self-disclosure). There, they had a pair of conversations of the type they were assigned, which provided the opportunity to rate the perception of partner responsiveness after he or she enacted the behavior. Specifically, as in studies using similar methods (e.g., Collins & Feeney, 2000), couples learned the topic they would be discussing, each person

⁴These restrictions were in place for an unrelated secondary set of goals for this data collection effort, regarding biology. Full instructions and questionnaires from this larger study on "understanding romantic relationships" are available from the first author. Reported in this manuscript are results from the primary goal of the data collection (i.e., the only report to date).

independently considered what they would discuss, then the couple had one conversation about each person's selection; each conversation lasted up to five minutes. Couples in the expressed gratitude condition received the same instructions reported elsewhere (Algoe et al., 2013):

We are interested in how couples talk about the kind things they do for one another. We are interested in hearing about specific things. We'd like you to think about a specific positive thing your partner did for you recently for which you felt grateful. Your partner's positive gesture may be something that happened before but continues to make you grateful, or something going on now. Some examples would be helping to solve a problem, surprising you with a gift, taking time to listen to a concern, spending time doing something he or she would not typically do, or similar things. We'd like you to pick something good that has been on your mind recently, no matter how big or small. We will ask you to thank your partner for his or her kind gesture in your interaction.

Couples in the active control condition received instructions analogous in structure, but emphasizing self-disclosure; instructions began as follows: "We are interested in how couples talk about the things that happen to them during the course of their day. We are interested in hearing about events that your partner did not participate in or witness. In particular, please focus on the seemingly ordinary events of your day." The respondent was explicitly informed, "When your partner is telling you about the details of his/her day, you can respond to, add to, or talk about as much or as little as you would under normal circumstances."

Content analysis of the conversations was outside the scope of this investigation. However, participants provided a brief text-based description of the event they planned to discuss, so we provide a few examples here. In the expressed gratitude condition, people thanked the partner for things like throwing a surprise birthday party, cooking or shopping for the person, insuring an engagement ring, staying home with the kids, allowing the expresser to stay home with the kids, and buying a piece of candy for the expresser. In the events of the day condition, people responded to partners' discussions of things like a meeting with the boss, phone calls from friends, joking around with co-workers, "going to the loo", checking email, and taking the dogs for a walk.

Critically, consistent with prior research (Gable et al., 2006), each participant provided a report of perceptions of the partner's responsiveness *when the partner was enacting the relationship behavior* (i.e., expressing gratitude or responding to a self-disclosure). This measure is the proposed moderator. Before leaving, they were given instructions about the activities during the coming month; over the next four weeks, participants independently completed brief nightly questionnaires and had five conversations (on average) with the partner on the assigned topic (the conversations comprise the one-month manipulation; see below for details). On the 28th day, they returned to the lab to have a final conversation in the lab and complete final questionnaires.

At-home conversation procedure—At the end of the lab session, participants received additional instructions about what they would be asked to do in the coming month. For

maximum control over the manipulation, and to be sure the relationship behaviors would not be overlooked by their targets (see Bolger et al., 2000; Gable, Reis, & Downey, 2003; Maisel & Gable, 2009 for examples of disagreement between independent couple-member reports about whether everyday relationship behaviors occur), participants were periodically asked to set aside time to have a conversation at home. Specifically, they were told that on four to six occasions over the course of the next month, each person would receive an email in the morning, requesting that they set aside 20–30 minutes on that particular day to have a pair of conversations like they just had in the lab. The experimenter emphasized that the reason for the random signaling was because there was no reason to believe that the conversation needed to be about *important* things, it was only important that the couple set aside some time to have the conversations; if they were not able to clear the 20–30 minutes for a private conversation on the signaled day, they were encouraged to do so the following evening instead. (Full instructions are available upon request from the first author.)⁵

Participants were asked to complete a brief online questionnaire about the conversation within 12 hours of having had it; the timing was permissive with the assumption that sometimes the only available time for the couple to have the conversation would be at the close of the day, and the primary aim of the questionnaire was to verify compliance with the experimental procedure. However, to justify its existence to participants, it included a few questions asking for global evaluations about the pair of interactions; below, we use them to round out understanding of the short-term effect of the interactions within the home setting.

Nightly questionnaire procedure—Participants were asked to complete a brief online questionnaire for each of 28 nights between lab visits, as an ecologically valid assessment of personal and relational outcomes.

Compliance and Administration of the Manipulation

Six couples (5 in the experimental condition and 1 in the control condition) failed to report completing even one at-home conversation and were thus considered to have not received the manipulation. Excluding these non-compliant couples left 94 participants in the final sample (i.e., both members of 47 couples: $N = 24$ couples [$n = 48$] in experimental group, $N = 23$ couples [$n = 46$] in control group). These couples collectively received 261 requests to have conversations and actually reported having had 234 (90%) conversations across the 28 days, as determined by conversation logs submitted by either partner. Specifically, in the control group, each couple completed 5.00 conversations on average ($SD = 1.17$) and missed .52 assigned conversations ($SD = 1.08$, $Sum = 11$ across all couples in this condition) whereas in the experimental group, each couple completed 4.96 conversations on average ($SD = 1.12$) and missed .63 assigned conversations ($SD = 1.21$, $Sum = 16$ across all couples in this condition). Participants completed 80.3% of all 2,576 assigned nightly reports ($n = 2,069$). Each participant in the experimental group completed 22.15 nightly reports on average whereas each one in the control group completed 22.83 nightly reports on average.

⁵These implementation decisions regarding timing and frequency were guided by concerns about adaptation to positive psychology manipulations that become routinized (e.g., Sin & Lyubomirsky, 2009), concern that participants in the experimental condition might feel pressure if they needed to sit down to thank the partner daily (thereby causing the conversations to be uncomfortable rather than positive), and a desire to emphasize that the to-be-thanked action could be small – anything that had come up in the previous few days. In the meantime, the active control condition conversations also benefit from these implementation decisions.

The group difference was not significant, $F(1, 91) = .31, p = .58$. Compliance on these tasks did not differ between conditions ($ps > .08$). An additional couple did not complete nightly reports and another did not attend the second lab session, reducing the sample size to 92 participants for analyses involving measures from those reports.⁶

Measures

Time 1 and 2—Prior to the manipulation, participants completed three measures for the current investigation. First, though perceptions of partner responsiveness after the lab interactions are expected to be specific to the interaction rather than to represent a global perception of the partner's responsiveness across all interactions (see Algoe et al., 2013; Gable et al., 2006; Reis et al., 2010), we nonetheless include a measure of global perceptions of partner responsiveness as a covariate, to test the effects of the manipulated behaviors beyond the way the participant generally perceives the partner's behavior in the relationship. This 18-item measure (Reis, 2006) formed a highly reliable composite ($\alpha = .93$).

In addition, to test our hypotheses about personal and relational outcomes over the course of the one-month study, participants completed two measures before random assignment to condition and again at the second lab session. Consistent with theorizing on gratitude (see Algoe, 2012), both measures are positively-valenced global evaluations, one of the relationship, the other of the participant's life. Specifically, one measure was the same seven-item relationship satisfaction measure (Hendrick, 1988; $\alpha = .86$) as used in recent research on expressed gratitude (Algoe et al., 2013). The second was a five-item global evaluation of satisfaction with life (Diener, Emmons, Larsen, & Griffin, 1985; $\alpha = .86$), used in prior experiments testing the downstream effects of positive emotion practices more generally (Fredrickson et al., 2008) and expressed gratitude interventions specifically (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011). Higher ratings on each scale represent greater satisfaction.

Lab: post-interaction—As in prior research (Algoe et al., 2013; Gable et al., 2006), participants completed a 10-item rating of the partner's responsiveness immediately after each interaction (Gable et al., 2006). In practice, for consistency, both participants completed this evaluation after each interaction (i.e., after enacting and after being the target of the relational behavior). However, for theoretical reasons outlined above, in the current investigation it is the psychological impact of the interaction on the target of the relational behavior that is of interest to test Hypothesis 2. Specifically, perceived partner responsiveness after being the target of either relational behavior (i.e., expressed gratitude or a partner's response to a self-disclosure) is thought to be an "active" psychological ingredient in relationship promotion (Algoe et al., 2013; Laurenceau et al., 1998).⁷ Thus, analyses focus on data each participant provided after his or her partner enacted the

⁶We recognize that some readers may be interested in whether this works as a *clinical intervention*, in which case non-compliant individuals are an interesting part of the research question of whether an intervention is useful. However, that was not our study design. Instead, we are interested in the theoretical question about injecting expressed gratitude into the couples' lives over the course of a month, thus require standardization across the experimental conditions in order to test hypotheses. We did not run analyses that included non-compliant couples, other than to test – for informational value – whether this group of 12 people (i.e., six couples) was different from the group of compliant couples on relationship duration and satisfaction, which were measured at study entry; they were not ($p = .655$ and $.500$, respectively).

relationship behavior in the lab, we call this variable “active perceived partner responsiveness” (APR, $n = 10$, $\alpha = .91$ and $\alpha = .94$ for T1 and T2 respectively).

Participants also reported on 26 emotion terms experienced as a result of the interaction, as a manipulation check to explore assumptions regarding emotional valence of the experimental and control conditions (e.g., that expressed gratitude would be relatively positive and self-disclosure would be relatively neutral in valence). We computed the average of the positive emotion terms (PE, $n = 12$, $\alpha = .87$ and $\alpha = .91$ for T1 and T2 respectively) and of the negative emotion terms (NE, $n = 14$, $\alpha = .90$ and $\alpha = .92$ for T1 and T2 respectively) from the reports after the partner enacted the relationship behavior in the lab. Participants completed all the same measures at the second lab visit as well.

At-home conversations: Short-term relational consequences—This questionnaire was intended as compliance check that would produce minimum burden for participants. As such, participants were asked to evaluate the *pair of conversations* as a whole (i.e., encompassing both the participant’s and the partner’s enacted relationship behavior) on several dimensions. Specifically, they rated perceived responsiveness of the partner after the pair of conversations ($n = 10$ items, Gable, et al., 2006, average $\alpha = .95$) on a 0 to 6 Likert scale, and relational consequences (measured by a composite score of: in tune with partner, understanding, caring, closeness, commitment, and attraction, average $\alpha = .94$) on 1 to 7 Likert scales. Higher scores represented more positive relational consequences.

Nightly questionnaires—Five outcomes were targeted within the nightly questionnaire, based on recent research on gratitude or prospective studies about downstream effects of positive emotions: global relationship quality, resilience/adaptation, positive emotions, negative emotions, satisfaction with life (i.e., Algoe et al., 2013; Koo, Algoe, Wilson, & Gilbert, 2008; Catalino & Fredrickson, 2011, Fredrickson, Tugade, Waugh, & Larkin, 2003; Fredrickson et al., 2008; Lyubomirsky et al., 2011). Daily global relationship evaluation was measured by one item: ‘Today our relationship was...’ (1=Terrible, 9=Terrific; Gable, Reis, & Downey, 2003). Resilience/adaptation and satisfaction with life were assessed by one global item adapted from Block & Kremin [1996] and Diener et al., [1985], respectively: ‘I adapted to change well today’ and ‘Today, I am satisfied with my life,’ (1=Strongly disagree, 7=Strongly agree). Finally, daily positive and negative emotions were assessed with a 12-item version of the modified Differential Emotions Scale (Fredrickson, Tugade, Waugh, & Larkin, 2003; average $\alpha = .95$ for positive emotion and average $\alpha = .87$ for negative emotion).

Overview of Data Analytic Strategy

Given the complexity of the data set, we performed a range of analyses, which is briefly summarized here. First, as a check for random assignment to condition, we used one-way ANOVA to test whether participants in the expressed gratitude condition were significantly

⁷In contrast, the *enactor’s* perception of partner responsiveness is conceptually murky, and we do not have predictions for these situations. Considering what it means to be responsive as the target of an expression of gratitude or while disclosing the events of one’s day would be a topic for a different paper; we do not consider these ratings further.

different from those in the control condition on demographics and pre-tested relationship attributes. Correlations between these potential covariates (viz., see Table 1) and the set of dependent outcomes were computed prior to running the primary models. Based on these findings and following recommendations by Pedhazur (1997), only those covariates found to be significant in the correlational analyses were included as control variables in the primary analyses; In addition, as indicated above, global perceptions of partner responsiveness, measured prior to the manipulation, was also included as a covariate in all hypothesis tests, for theoretical reasons. Specific covariates included in each model are reported in the footnote of the corresponding table or figure.

For the primary analyses, the data were structured hierarchically and a series of hierarchical linear models controlling for the interdependence within couple and within person were tested in SAS Proc Mixed program by using restricted maximum likelihood estimator to examine the main effects of the manipulation as well as the moderation effect of the individual difference in perceived responsiveness of the partner's active relationship behavior (APR) on the associations between the manipulation and outcomes. Specifically, to examine the effects of the manipulation on immediate psychological response during the initial lab interaction (T1) and the follow-up lab interaction one month later (T2), individual level reports were nested under couples to control the interdependence between dyad members. For analyses involving the daily outcomes, the nightly reports and conversation events reports were nested under couples. Specifically, nightly and conversation event reports from both partners were matched by time of occurrence, and then modeled at Level 1 (L1). Couple level records including fixed attributes of the couple member (e.g., perceived partner's responsiveness) and of the couple itself (e.g., experimental condition) were modeled at Level 2 (L2). Two-level structures are generally preferred over three-level structures (i.e., daily reports nested within individuals nested within couples) because in longitudinal dyadic study, time and person are usually crossed rather than nested. That is, for a given dyad, the time point is usually the same for the two persons (i.e., both partners are usually assessed at the same time). Therefore two-level structure described above not only controls for dependencies between couple members, but also enables the temporal matching of male and female partner reports at each measurement occasion, controlling for the interdependence between the two dyad members' residuals at specific point in time (Kashy, & Donnellan, 2012; Kenny, Kashy, & Cook, 2006; Laurenceau & Bolger, 2005).

Results

Manipulation Check

Assumption of random assignment to experimental condition—As shown in Table 1, participants in the expressed gratitude and control conditions did not significantly differ on the demographic variables of age, race, education level, family income, or parenthood status. Furthermore, participants in two conditions did not significantly differ in relationship duration, global perceptions of partner responsiveness (which is conceptually similar to the proposed moderator), relationship satisfaction, or life satisfaction.

Acute impact of the partner's relationship behavior in the initial lab

interaction, and at follow-up—Table 2 provides descriptive information regarding the post-interaction perceptions of enactor responsiveness. At the first lab session, descriptively, perceived enactor responsiveness was quite high after each type of interaction in the initial lab visit (i.e., after the person's partner either *expressed gratitude* or *responded to the person's self-disclosure*). These ratings did not significantly differ between conditions after the initial lab interaction at T1. However, one month later, participants reported greater perceived partner responsiveness after being the target of a gratitude expression than after the partner responded to one's self-disclosure in the follow-up lab interaction.

Table 2 also provides descriptive information regarding the affective valence of the interactions. As expected, the target's positive emotions experienced after either type of interaction were above the midpoint of the scale, but significantly higher after being the target of a gratitude expression than after a partner's response to a self-disclosure, at each time point. The target's negative emotions after either type of interaction were close to the bottom of the scale. After the initial lab interaction, the participants reported greater negative emotions after being the target of a gratitude expression. However, the negative emotions did not significantly differ between conditions after the follow-up lab interaction one month later.

We also compared the acute impacts of the first and the second lab interaction on perceived partner responsiveness and emotions by conducting three paired-sample t-tests within each condition. The results revealed no significant changes from T1 to T2 lab interaction in either condition ($ps > .112$ for active control condition; $ps > .320$ for expressed gratitude condition), consistent with the notion that, in these long-term relationships, participants' perspectives on the partner's relationship behaviors are stable. Said another way, the manipulation can be assumed to have explicitly introduced the specific relationship behavior into the couple's routine, but did not appear to influence perceptions of the enactor's behavior.

Descriptive information about the experimental inductions in the home setting

—The recalled impressions of the conversations in the home setting, typically reported by the next day, were used to explore differences between experimental inductions over the month. Multilevel models accounting for multiple reports per person show that the rating of perceived partner responsiveness that took the entire conversation into account (i.e., after both enacting and being the target of the relational behavior) was higher for participants in the expressed gratitude condition than for participants in the control group ($M = 5.29$ vs. 5.05 , $b = .24$, $p = .017$). Participants in the expressed gratitude condition also reported significantly more positive relational consequences than did those in the control condition ($M = 5.82$ vs. 5.22 , $b = .60$, $p = .001$).

Hypothesis 1: Main Effects of Experimental Condition

Nightly outcomes—The 28 nightly reports allowed a robust and ecologically valid assessment of the influence of the manipulation on both interpersonal and intrapersonal outcomes. The five outcomes were overall relationship evaluation, resilience/adaptation,

positive emotions, negative emotions, and satisfaction with life. First, we tested a set of individual growth models to investigate whether each individual's daily outcomes changed over time and whether the change over time, if any, was a function of experimental condition. Examining the main effects (linear or quadratic) of time across 28 days revealed that, for all participants, a small but significant linear effect of time was found for positive emotions, $b = -.005$, $p = .005$, and satisfaction with life, $b = -.010$, $p < .000$, suggesting that all participants experienced a small amount of decrease in positive emotions and satisfaction with life over the 28 days. However, examining the time by condition interactions in these models indicated no significant interactions for any dependent outcome ($p > .10$). This suggests there was no linear trend across 28 days on any dependent outcome specifically as a function of experimental condition. We next turn to the basic research question of whether, on average, experimental condition influenced participants' everyday outcomes over the course of the study.

The effect of condition on personal and relationship outcomes was tested using hierarchical linear modeling, with nightly reports nested within individual; these analyses effectively model the impact of expressed gratitude on the *28-day average* of the outcome of interest, and are particularly reliable estimates because they account for within-person variance and within-couple dependence in the outcomes. Experimental condition was included as a predictor, and covariates were included when they were significantly associated with the dependent measure, as discussed above; see Table 3 for specific covariates used for each model. In addition, pre-tested global perception of partner responsiveness was included in all models as a control variable.

Of the five nightly outcomes, experimental condition had significant impacts on two: ability to adapt to change and positive emotions, as well as a marginally significant effect on relationship evaluation. Specifically, participants in the expressed gratitude condition reported higher relationship evaluation, greater ability to adapt to change and more positive emotions over the 28 days of the study than did those in the control condition. Participants in two conditions did not differ in daily negative emotions or satisfaction with life. See the top panel of Table 3 for descriptive statistics and outcomes of these analyses.

Global evaluations of satisfaction one month later—Bivariate correlations between T1 and T2 assessments on the same variable indicated that participants' global satisfaction with the relationship and with life were each very stable across time, $r_s > .75$, $p < .000$. The impact of condition on relationship and life satisfaction change from Time 1 to Time 2 was tested in a set of hierarchical linear models in which the Time 2 assessed variable (i.e., either relationship or life satisfaction) was predicted from condition and the corresponding variable assessed at Time 1. As shown in the bottom panel of Table 3, the main effect of condition was not significant for either relationship or life satisfaction, indicating no significant growth or decline in either of these variables from baseline values as a function of condition.⁸

⁸Whether couples randomly received 4, 5, or 6 conversation requests was only incorporated into the design to hedge against participants' adaptation to the experimental inductions; we did not have predictions that this variable would influence the outcomes. However, in practice, couples had different "doses" of the induction, so we tested whether number of doses moderated the main effects of condition on T2 outcomes, controlling for the T1 value on the same measure; it did not ($b = .05$, $p = .50$ for relationship satisfaction and $b = .03$, $p = .83$ for life satisfaction).

Hypothesis 2: Perceived Responsiveness of Enactor as a Moderator of Experimental Condition Effects

As indicated above, we use the participant's rating of perceived partner responsiveness after the partner's enacted relationship behavior in the initial lab session to test Hypothesis 2, because it is the cleanest spontaneous index of the perception of the enactor's behavior. Notably, in support of the idea that this initial lab rating measured a stable perception of the partner's particular relationship behavior, perceived responsiveness after the partner's enacted behavior (APR) was correlated across the two lab visits at .41 ($p < .001$), and did not significantly differ across two lab occasions, $t = -.24$, $p = .81$.

Nightly outcomes as moderated by perceived enactor responsiveness—An additional set of hierarchical linear models was conducted to test whether the active perceived partner responsiveness (APR) moderated the effect of experimental condition on the target's daily personal and relationship outcomes in the following month. Each model included main effects of experimental condition and APR, the interaction term combining the two variables, as well as pre-tested global perception of partner's responsiveness and any other relevant covariates (see the footnote of Figure 1 to Figure 5 for specific covariates of each model).

As shown in the top panel of Table 4, the APR by condition interaction was found to significantly predict daily relationship evaluation, adaptation, positive emotion, negative emotion, and satisfaction with life, suggesting significantly different roles of APR in two conditions. As shown in Figure 1 through Figure 4, examining the simple effects of APR within each condition revealed that in the expressed gratitude condition, people who perceived greater responsiveness in their partner's behavior experienced significantly higher daily satisfaction with their relationship, higher ability to adapt, more positive emotion and less negative emotion as well as higher satisfaction with life over the diary period than those who perceived less responsiveness, whereas the effects of APR on these outcomes were non-significant or less significant for people in the control condition.⁹

Change in global evaluations of satisfaction as moderated by perceived enactor responsiveness—We tested an additional set of hierarchical linear models predicting change in T2 outcomes from APR, experimental condition, and the APR by condition interaction, while the T1 assessment of the outcome of interest was also controlled. The interaction between APR and experimental condition was marginally significant when predicting change in relationship satisfaction and life satisfaction at T2 (see the bottom panel of Table 4). As shown in Figure 5, simple effects analyses revealed that in the expressed gratitude condition, people who perceived greater responsiveness in their partner's behavior experienced significantly higher relationship satisfaction and marginally significantly higher life satisfaction by the end of the study than did those who perceived less responsiveness. In contrast, in the control condition, the APR did not significantly

⁹None of these effects were further moderated by time (i.e., day of study), suggesting APR did not moderate any potential linear growth effect within either condition.

predict their T2 evaluation of relationship or life satisfaction when controlling for the T1 assessment.

Discussion

The current investigation tested whether injecting gratitude into ongoing close relationships can improve personal and relational well-being, compared to having another type of interaction thought to generate relational intimacy. This one-month-long experiment, one of the first of its kind, provides a conservative test of the causal role of gratitude in the context of ongoing relationships. When placing the behavior in context, we drew from theory to take a whole-dyad view of the relationship. Specifically, the study design accounted for the important role of perceptions of the partner's behavior in the context of ongoing relationships. As such, the results illuminate the potential of gratitude for personal and relational well-being while simultaneously offering important caveats to artificial injection of expressed gratitude in ongoing relationships.

One published experiment of which we are aware asked participants to express gratitude to their partners and demonstrated relational benefit for the participants themselves (results reported in Lambert et al., 2010; Lambert & Fincham, 2011). However, from those reports it is not known (a) whether study participants actually did express gratitude, nor (b) what the effects may have been for the relationship partner. Our experiment documents the active injection of expressed gratitude into the social interactions of relationship pairs, and measures consequences for both individuals, with special emphasis on the target of the relationship behavior. On average, expressing gratitude only demonstrated evidence of additional intrapersonal or interpersonal benefits, beyond the effects of the relationally active control condition over the course of a month, in two of seven models (three if including the effect that approaches $p < .05$). Interestingly, these two particular outcomes – daily positive emotions and ability to adapt (i.e., resilience) – are likely best explained by the fact that expressed gratitude is a positively-valenced psychological construct (e.g., Fredrickson et al., 2008; Fredrickson et al., 2003; Catalino & Fredrickson, 1998). On the other hand, the prediction about relationship satisfaction comes directly from recent research on the emotion of gratitude (Algoe et al., 2013); in turn, satisfaction with life is robustly linked with high-quality relationships (see Lyubomirsky, King, & Diener, 2005, for review). Of note, at study entry, these were very satisfied couples, with an average relationship satisfaction rating of 6.33 out of 7; it is very likely that couple members already employed several behavioral strategies to maintain that satisfaction, so adding specific relationship behaviors may have had less impact. However, this is where the whole-dyad perspective is critical for improved understanding of incorporating expressed gratitude into ongoing relationships.

Along with others (e.g., Gable et al., 2006; Laurenceau et al., 1998; Reis & Shaver, 1988), we suggest that the psychological impact of a relationship behavior on its target is one key component of an interpersonal process. After a social interaction, the impression a person walks away with can set the stage for the next interaction (i.e., its likelihood, its quality) perhaps by changing the way they view themselves as well as the relationship with the other individual. Elsewhere, the case has been made that the emotion of gratitude provides fuel to coordinate mutual displays of responsiveness between members of ongoing relationships

(Algoe, 2012). In the current study, we tried to jump-start that process with the behavioral expression of gratitude. Only when the target of the expression saw the expresser as being responsive did we see the predicted positive associations between being in the gratitude condition and a wide range of beneficial outcomes. Simple effects on the five targeted daily outcomes and change in two evaluations of satisfaction (i.e., with the relationship and with life) were in the expected direction in the expressed gratitude condition. In the meantime, though perceived responsiveness after the partner has a chance to respond to a self-disclosure is associated with beneficial relationship outcomes in prior research (Laurenceau et al., 1998), simple effects analyses showed that perceptions of a partner's responsiveness following self-disclosure was only significantly associated with one of the seven outcomes; these coefficients were significantly smaller than the same associations within the expressed gratitude condition.

The current findings draw from recent insights on the role of gratitude in social life to reinforce the messages there: the emotion of gratitude is embedded within a dynamic system. For example, whether gratitude is experienced at all depends on how the benefactor's gesture is perceived (e.g., Algoe et al. 2008) and the current data suggest that whether an expression is beneficial at least depends on how the benefactor perceives it. Thus, the greater contribution to both theory and practice is that this study employed the lens and methods of relationship science to test a basic research question that highlights an important consideration for the application of recent findings regarding the "power" of gratitude in the context most relevant: real, ongoing relationships.

It is notable that the emotions-based literature on gratitude as experienced (e.g., Algoe et al., 2008; Algoe et al., 2010; Kubacka et al., 2011) or expressed (e.g., Algoe & Stanton, 2012; Lambert & Fincham, 2011; Lambert et al., 2010) has focused on relational behavior and outcomes; the current study is some of the first research of which we are aware in this literature to show effects on intrapersonal outcomes (and see Chang, Li, Ten, Berki, & Chen, 2013). There are at least three ways in which the findings for intra-personal outcomes add value to the literature. First, these findings provide an important extension of evidence for the *find*, *remind*, and *bind* theoretical perspective that, as a positive emotion, gratitude can bring adaptive value for both members of the pair, with accumulation; in fact, we believe these data strengthen that case. Specifically, we believe that the variety of daily beneficial outcomes for the benefactor – in addition to positively-valenced outcomes, lower negative emotions – increases confidence in the impact of the manipulation for those whose partners were perceived to be particularly responsive when expressing gratitude. Finally, these results make a theoretical and empirical bridge to findings from the literature on the grateful disposition (Wood et al., 2010): Repeated instances of gratitude toward others are thought to contribute to the grateful disposition construct and would presumably influence the personal well-being effects others have found (Wood et al., 2010); the findings from the current study thus provide documentation that one of the building blocks that make up this construct (i.e., social interactions) is empirically linked to similar effects.

Limitations, Future Research, and Implications for Practitioners

Though this is one study with a moderate sample size ($N = 94$), findings are consistent with a priori theory and build directly on published evidence. The control relationship behavior was selected due to prior theoretical (Reis & Shaver, 1988) and empirical (Laurenceau et al., 1998) links to perceived responsiveness, and anticipated emotional neutrality. Thus, the current data do not address whether expressed gratitude is more beneficial than other types of positively-valenced relationship behaviors, but instead provide much-needed initial evidence regarding causality beyond another relationship behavior theorized to produce intimacy. Related, we acknowledge that verbally expressing gratitude is a direct action whereas responding to a partner's self-disclosure depends on the direction the discloser takes the conversation; of course, this directness may partially explain why gratitude expressions could be a stronger driving force in relationship promotion than responding to a self-disclosure. We see this as an interesting question for future research to unpack rather than a point that undermines the contribution of the current findings: each behavior has been proposed to promote relationships via perceptions of responsiveness, and here, we provided a first set of tests regarding whether the behaviors have different impact. In fact, we find it interesting that the simple effects within the control condition do not conceptually replicate prior conclusions regarding perceived enactor responsiveness to a self-disclosure and relational benefits (see Table 5), though note that the method of the current study was different: whereas prior tests employed *self-reported* degree of self-disclosure following a dyadic interaction (Laurenceau et al., 1998; Manne et al., 2004), here, participants were randomly-assigned to a condition in which the partner had the opportunity to respond to a self-disclosure. The current study built on prior theory and findings to assume that, without special instruction, the actual enacted behavior would vary within each condition; we chose to focus on *perceptions* of that behavior.

In the reality of ongoing relationships, people have routine ways of enacting and perceiving everyday relationship behaviors (see Stapleton & Bradbury, 2012). Some of our results open the door to the possibility that injecting an expressed gratitude practice into relationships where the partner does not typically express well may actually backfire. For example, Figure 4b illustrates that people in the expressed gratitude condition with unresponsive partners had *greater* negative emotions across 28 days, relative to people in control with unresponsive partners. Of course, because there was no waitlist control condition, we cannot know if all participants benefitted some, but those in the expressed gratitude with partners who were perceived to be low on responsiveness benefitted the least. Nonetheless, these results should provide a call for additional research: would people whose partners are low in responsiveness when expressing gratitude be better off discussing the mundane details of the day with the partner? Do all participants have some benefit in each condition? Moreover, these were satisfied couples. However, within distressed couples, partners may be seen as less responsive when spontaneously enacting relationship behaviors; in fact, perhaps counter intuitively, incorporating positive behaviors into couples therapy is often difficult to implement successfully, especially relative to the effectiveness of simply getting people to stop negative behaviors (Epstein & Baucom, 2002).

Due to its empirically documented impact on the expresser, expressed gratitude is already considered one of the most effective ways to apply positive psychology concepts for the benefit of an individual's mental health (see review in Sin & Lyubomirsky, 2009); the current study does not undermine those findings but adds that, in reality, people have targets of their expressions, and those are likely to be people with whom they are in ongoing relationships (Reis et al., 2000). Moreover, given recent publications documenting some benefits of expressed gratitude in the social context (e.g., Algoe & Way, 2014; Algoe et al., 2013; Grant & Gino, 2010; Williams & Bartlett, 2014), and a recent infusion of researcher and practitioner interest in gratitude (Expanding the Science and Practice of Gratitude, 2015), the current focus on a key moderator in the real-world context of ongoing relationships is timely.

In the past 15 years, there has been widespread public and practitioner interest in positive psychology constructs, with promising correlational findings becoming quickly translated to coaching practices or therapeutic applications in various settings (e.g., American Psychologist Special Issue, 2011). Such well-intentioned attempts to bring benefit to others are likely based on the assumption that there is no downside to giving it a try. Yet, aside from the potential for lost time and resources, recent reviews of experimental evidence demonstrate that implementing what sound like patently "good" strategies can backfire (see Wilson, 2012). This is an especially important consideration in the domain of close relationships, which are central to well-being and even longevity (see meta-analysis in Holt-Lunstad, et al., 2010). Relevant to gratitude's status as a positive emotion, a recent review demonstrates that positive valence does not always translate to beneficial outcomes but depends on the context (McNulty & Fincham, 2012), and experimental evidence documents that striving for positive emotions can backfire (Mauss, Tamir, Anderson, Savino, 2011).

Given the importance of close relationships for mental and physical health, the current findings call for more basic research conducted in context. Only from such evidence and attendance to social psychological theory will it be possible to effectively harness the dyadic benefits of gratitude that have been observed naturally. We envision several required steps to use expressed gratitude for positive change within a dyadic relationship, including identifying the specific behaviors within an expression of gratitude that are most impactful for its target, and determining how to effectively train people to implement it with authenticity. Ironically, it is precisely because gratitude's social functions are especially tuned in to perceptions of responsiveness (Algoe, 2012) that artificially injecting it into ongoing dyadic systems will take care.

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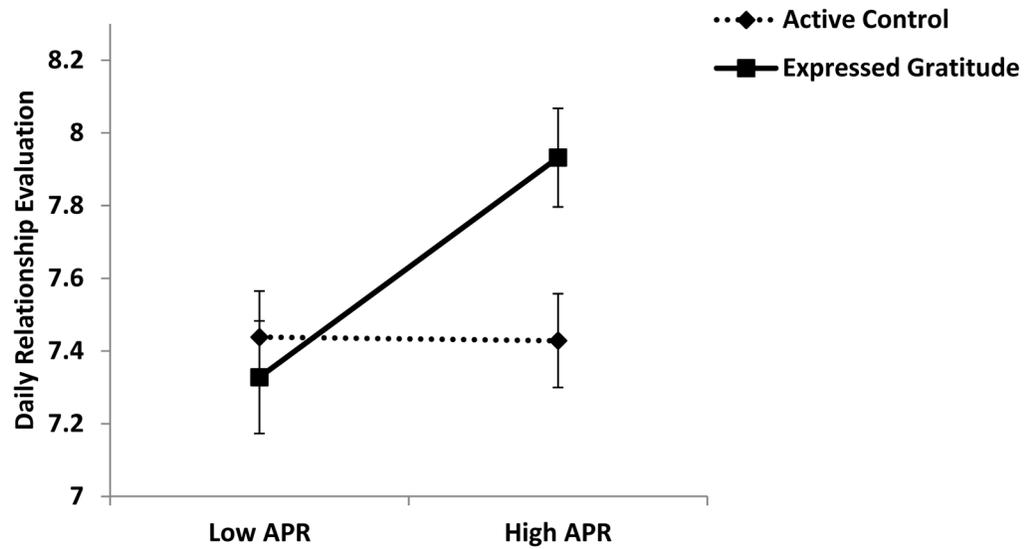


Figure 1. Individual difference in active perceived partner responsiveness (APR) predicting daily relationship evaluation in two conditions. Pre-tested relationship satisfaction and global partner perceived responsiveness, race, family income, and relationship type were controlled. Range of daily relationship evaluation scale: [1, 9]. Condition \times APR interaction: $b=.45$, $p<.000$; simple slope: $b=.44$, $p<.000$ for Expressed Gratitude condition, $b=-.01$, $p=.892$ for Active Control condition.

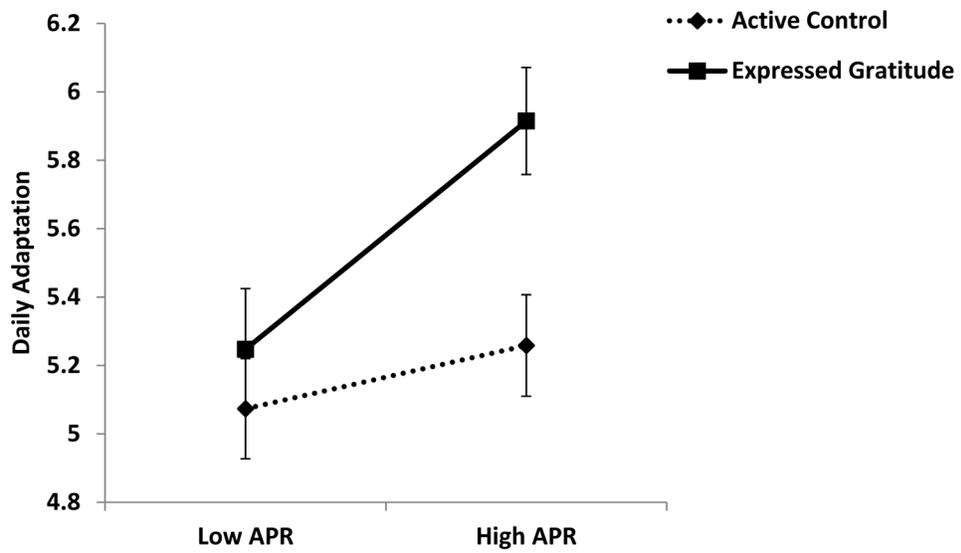


Figure 2. Individual difference in active perceived partner responsiveness (APR) predicting daily adaptation in two conditions. Pre-tested global partner perceived responsiveness, family income, and relationship type were controlled. Range of daily adaptation scale: [1, 7]. Condition \times APR interaction: $b=.35$, $p=.010$; simple slope: $b=.49$, $p<.000$ for Expressed Gratitude condition, $b=.14$, $p=.029$ for Active Control condition.

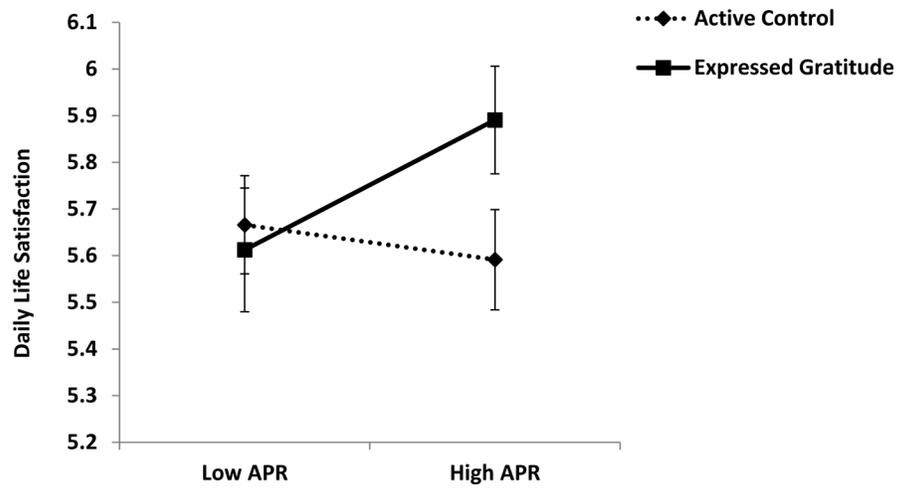


Figure 3.

Individual difference in active perceived partner responsiveness (APR) predicting daily satisfaction with life in two conditions. Range of daily satisfaction with life scale: [1, 7]. Pre-tested global partner perceived responsiveness, family income, and relationship duration were controlled. Condition \times APR interaction: $b=.26$, $p=.024$; simple slope: $b=.20$, $p=.049$ for Expressed Gratitude condition, $b=-.05$, $p=.298$ for Active Control condition.

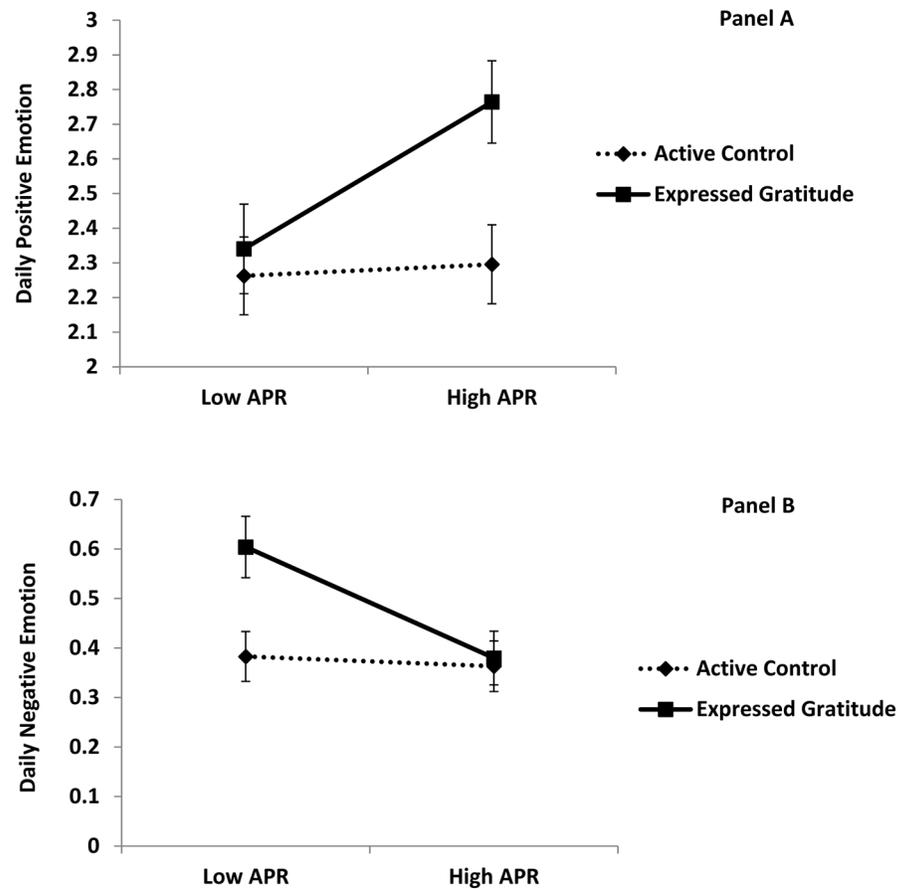


Figure 4. Individual difference in active perceived partner responsiveness (APR) predicting daily positive and negative emotions in two conditions. Range of daily positive and negative emotions scale: [0, 4]. For positive emotions (panel A), pre-tested global partner perceived responsiveness, family income, and race were controlled. Condition \times APR interaction: $b = .29$, $p = .001$; simple slope: $b = .31$, $p < .000$ for Expressed Gratitude condition, $b = .02$, $p = .544$ for Active Control condition. For negative emotions (panel B), pre-tested global partner perceived responsiveness, race, and relationship duration were controlled. Condition \times APR interaction: $b = -.15$, $p = .003$; simple slope: $b = -.16$, $p < .000$ for Expressed Gratitude condition, $b = -.01$, $p = .529$ for Active Control condition.

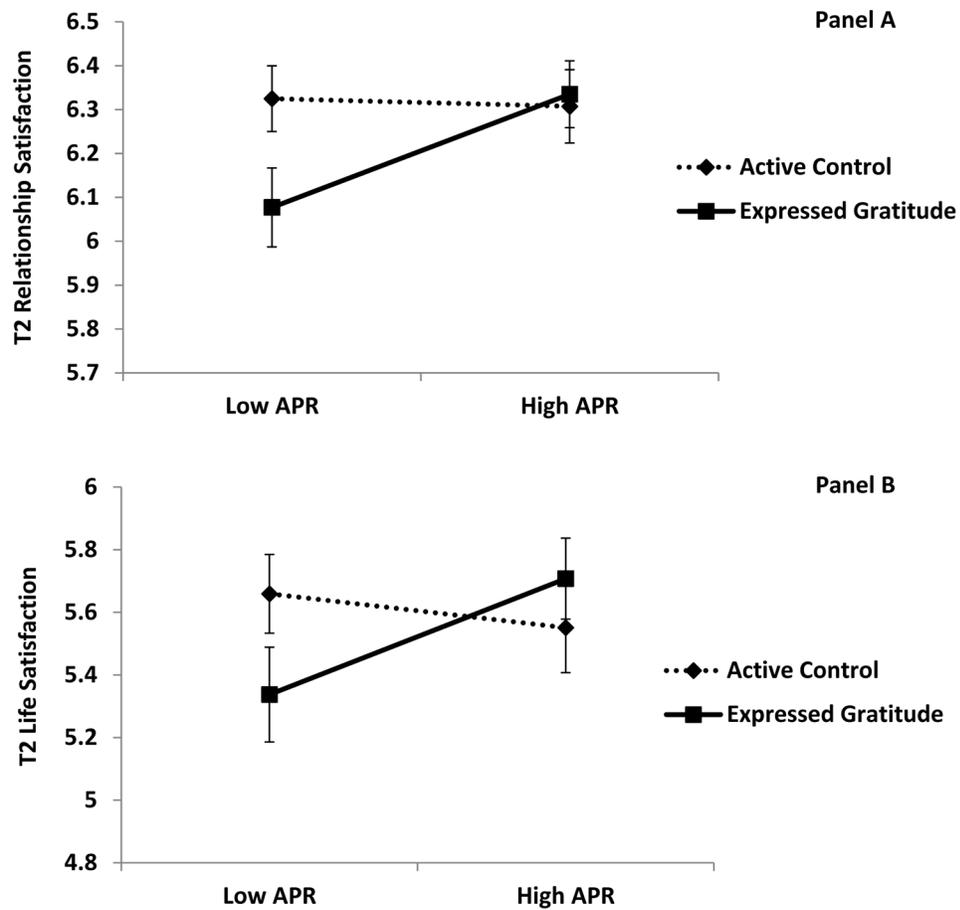


Figure 5. Individual difference in active perceived partner responsiveness (APR) predicting T2 outcomes in two conditions. Corresponding T1 variable was controlled. Range of T2 relationship and life satisfaction scale: [1, 7]. For relationship satisfaction (panel A), pre-tested relationship satisfaction, global partner perceived responsiveness, and age were controlled. Condition \times APR interaction: $b = -.20$, $p = .089$; simple slope: $b = .19$, $p = .035$ for Expressed Gratitude condition, $b = -.01$, $p = .871$ for Active Control condition. For life satisfaction (panel B), pre-tested life satisfaction and global partner perceived responsiveness were controlled. Condition \times APR interaction: $b = -.35$, $p = .090$; simple slope: $b = .27$, $p = .076$ for Expressed Gratitude condition, $b = -.08$, $p = .571$ for Active Control condition.

Table 1
Group Comparison of Demographics and Pre-Tested Relationship Variables

	Active Control		Expressed Gratitude		F/X ²
	M.	SD.	M.	SD.	
Demographic					
Age	28.98	3.46	30.48	5.70	2.18
Education ^a	4.40	1.13	4.35	1.57	.04
Family income ^b	6.55	2.41	6.13	2.47	.64
Race (White/Caucasian)	80.4%		66.7%		2.28
Child (yes)	9.5%		10.9%		.04
Relationship Variables					
Time with partner (months)	73.04	39.13	60.69	35.78	2.56
Global perceived responsiveness ^c	6.27	.49	6.21	.60	.27
Relationship satisfaction ^c	6.43	.38	6.26	.71	2.09
Life satisfaction ^c	5.82	.84	5.45	1.22	2.99

Note: N=86. M, SD are the mean and standard deviation of raw scores.

^aThe range of education is 1-high school to 7-doctoral degree; 4 represents bachelor's degree.

^bThe range of family income is 1-\$0 to \$14,999 to 9-\$85,000 +; 6 represents \$55,000 to \$64,999.

^cThe range of the life satisfaction scale is [1, 7].

Table 2
Group Comparison of Perceived Partner Responsiveness and Affect after the Partner Had a Chance to Enact the Relationship Behavior in the Lab at Time 1 and Time 2

	Active Control		Expressed Gratitude		Condition Effect	
	<i>M.</i>	<i>SE.</i>	<i>M.</i>	<i>SE.</i>	<i>B.</i>	<i>Sig.</i>
T1APR	5.26	.10	5.45	.10	.18	.203
T1PE	4.04	.13	4.77	.13	.73	.000
T1NE	.23	.06	.41	.06	.18	.050
T2APR	5.30	.07	5.59	.07	.29	.009
T2PE	3.74	.17	4.70	.17	.96	.000
T2NE	.12	.04	.21	.04	.09	.129

Note: N=90. APR= active partner responsiveness; PE=positive emotion; NE=negative emotion. M=predicted mean value from the model; SE=standard error of the predicted value; B=unstandardized coefficients. The range of APR, PE or NE scale is [0, 6]. HLM models were used to compare the mean level difference between two groups in terms of variables in the table.

Table 3

Main Effect of Condition on Participant's Daily and T2 Outcomes

	Active Control		Expressed Gratitude		Condition Effect	
	<i>M.</i>	<i>SE.</i>	<i>M.</i>	<i>SE.</i>	<i>B.</i>	<i>Sig.</i>
Daily Outcomes						
Relationship Evaluation	7.39	.12	7.71	.13	.32	.079
Adaptation	5.16	.14	5.66	.14	.50	.016
Positive emotions	2.28	.11	2.59	.11	.32	.046
Negative emotions	.37	.05	.46	.05	.09	.210
Life satisfaction	5.64	.10	5.80	.10	.16	.288
T2 Outcomes						
Relationship Satisfaction	6.30	.06	6.25	.06	-.05	.529
Life Satisfaction	5.61	.10	5.52	.10	-.09	.531

Note: N=92. B-unstandardized coefficients. M-predicted mean value from the model; SE-standard error of the predicted value. Multilevel modeling was used to conduct all analyses. The range of daily relationship evaluation scale is [1, 9]; the range of daily adaptation and life satisfaction scale is [1, 7]; the range of daily positive and negative emotion scale is [0, 4]; the range of T2 relationship and life satisfaction scale is [1, 7]. The pre-test global perceived responsiveness was controlled in all models. In addition, pre-tested relationship evaluation, sex, relationship type, race and family income were controlled when daily relationship evaluation was tested; relationship type and family income were controlled when daily adaptation was tested; race and relationship duration were controlled when daily negative emotion was tested; race and family income were controlled when daily positive emotion was tested; family income, relationship duration and pre-tested life satisfaction were controlled when daily life satisfaction was predicted; age and T1 relationship satisfaction were controlled when T2 relationship satisfaction were tested; age and T1 life satisfaction were controlled when T2 life satisfaction were tested.

Perceived Responsiveness of Enactor’s Relationship Behavior Moderates the Effect of Condition on Participant’s Daily and T2 Outcomes

Table 4

	Active Control		Expressed Gratitude		Condition X APR Interaction	
	<i>B.</i>	<i>Sig.</i>	<i>B.</i>	<i>Sig.</i>	<i>B.</i>	<i>Sig.</i>
Daily Outcomes						
Relationship Evaluation	-.01	.892	.44	.000	.45	.000
Adaptation	.14	.029	.49	.000	.35	.010
Positive emotions	.02	.544	.31	.000	.29	.001
Negative emotions	-.01	.529	-.16	.000	-.15	.003
SWLS	-.05	.298	.20	.049	.26	.024
T2 Outcomes						
Relationship Satisfaction	-.01	.871	.19	.035	.20	.089
Life Satisfaction	-.08	.571	.27	.076	.35	.090

Note: N=92. B-unstandardized coefficients. The pre-test relationship evaluation was controlled when relational outcomes were tested. The corresponding T1 variable was controlled in all analyses when T2 outcomes were tested.