

“Paying it forward” via satisfying a basic human need:

The need for relatedness satisfaction mediates gratitude and prosocial behavior

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### Abstract

People who receive kindness tend to feel gratitude and act in a prosocial manner toward third persons (i.e., “paying it forward”). Combining the separate evidence that (1) gratitude leads to the formation of strong psychological bonds from a beneficiary to a benefactor; and (2) people become more prosocial toward strangers when the need for relatedness (NFR) is satisfied, two online experiments were conducted to examine if NFR satisfaction mediates the association between gratitude and prosocial behavior toward third persons. After evoking gratitude by recalling past experiences (Study 1) or writing a letter to someone (Study 2), participants were asked to make a donation from their remuneration for the experiment to a charity organization. As predicted, emotional manipulation promoted donation via feelings of gratitude and satisfied NFR. Implications of the current model for integrating previous findings are discussed.

*Keywords:* gratitude, paying it forward, indirect reciprocity, need for relatedness, donation, online experiment

Gratitude plays an important role in our society. Gratitude improves mental health (Wood, Froh, & Geraghty, 2010) and maintains good bonds between benefactors and beneficiaries (Algoe, Gable, & Maisel, 2010). Consequently, gratitude stabilizes dyadic relationships and enables us to maintain our society in the long term (Simmel, 1950). Many studies have also documented the importance of gratitude for other prosocial tendencies, which impose some costs on us to benefit other individuals (McCullough, Kimeldorf, & Cohen, 2008). Although feelings of gratitude promote a desire to “pay it forward” or pass on prosocial behavior to third parties (Bartlett & DeSteno, 2006), it is unknown how gratitude facilitates the process. The current study examined whether a need for relatedness (NFR) satisfaction, which promotes prosocial behavior, mediates the relationship between feelings of gratitude and prosocial behavior toward strangers.

Gratitude is defined as “a positive emotional reaction to the receipt of a benefit that is perceived to have resulted from the good intentions of another” (McCullough, Kilpatrick, Emmons, & Larson, 2001). Some factors associated with prosocial behavior (e.g., value, cost, and altruistic intention) evoke strong feelings of gratitude (McCullough et al., 2008; Tesser, Gatewood, & Driver, 1968). Trivers (1971) highlighted the evolutionary functions of gratitude from the viewpoint of reciprocal altruism; that is, gratitude has qualities of evolutionary adaptation for maintaining continuous reciprocal relationships between benefactors and beneficiaries. Supporting this view, gratitude promotes direct reciprocity in people after they receive benefits from a benefactor in several social situations. For example, when participants receive kindness from a confederate in an experimental setting, they are likely to behave in a prosocial manner toward the confederate in order to express their gratitude (Tsang, 2006). In the service industry,

customers who appreciate good restaurant service are more likely to intend to revisit a restaurant in the future (Kim & Lee, 2013).

In addition, gratitude promotes indirect reciprocity, known as “paying it forward,” or prosocial behavior from a beneficiary of support to a stranger (see Nowak & Roch, 2007). People become inclined to cooperate with a stranger after they are helped by another stranger and feel gratitude (Bartlett & DeSteno, 2006). Feelings of gratitude also foster altruistic decision making in social dilemma situations (DeSteno, Bartlett, Baumann, Williams, & Dickens, 2010). Thus, it is important to examine the reason *why* feelings of gratitude promote paying it forward. As discussed above, gratitude was evolutionarily selected as a function of reciprocal altruism and maintains dyadic reciprocal relationships (Trivers, 1971). From this viewpoint, gratitude promotes *only* direct reciprocity in order to establish and maintain good relationships between beneficiaries and benefactors. Therefore, indirect reciprocity should be rooted in other psychological mechanisms related to the process of paying it forward in extended social networks.

Self-determination theory (Ryan, Huta, & Deci, 2008) might help to identify the missing link between gratitude and prosociality toward strangers. The theory assumes three types of basic human needs: the need for competence, for autonomy, and for relatedness (NFR). Satisfaction of these needs increases intrinsic motivation, facilitates psychological development, and improves subjective well-being. In particular, satisfaction of NFR makes people place incremental values on this need (Moller, Deci, & Elliot, 2010). In other words, if people achieve NFR through prosocial behavior, they will do the same thing in order to further achieve NFR. Supporting this notion, NFR satisfaction promotes prosocial behavior. Pavey, Greitemeyer, and Sparks (2011) found that people primed with relatedness satisfaction showed higher prosocial intentions and

donated more money toward a third party than those primed with satisfaction of the need for competence and the need for autonomy. In addition, NFR satisfaction mediated the association of the priming condition with the degree of prosocial intentions and the amount donated. Furthermore, the prosocial tendency was effective only when NFR satisfaction, not NFR dissatisfaction, was primed (Prentice & Sheldon, 2015). These findings suggest that a temporary satisfaction of NFR leads people to be more prosocial in order to further satisfy NFR in future interactions with others, and that this process does not involve compensation for the lack of NFR.

From a social network perspective, gratitude contributes to the formation of strong emotional bonds in a dyadic relationship (Gordon, Impett, Kogan, Oveis, & Keltner, 2012). The Find-Bind-Remind theory (Algoe, Haidt, & Gable, 2008) explains the role of gratitude in building, maintaining, and improving relationships. For example, feelings of gratitude predict the quality and quantity of relationships of first-year undergraduates with senior students (Algoe et al., 2008). Gratitude also plays an important role in romantic relationships. When people feel gratitude to their partner, they increase the strength of their commitment to him/her, which is separate from feelings of trust (Joel, Gordon, Impett, Macdonald, & Keltner, 2013). In addition, two longitudinal studies found a positive causal relationship between gratitude at Time 1 and NFR satisfaction at Time 2 (Kashdan, Mishra, Breen, & Froh, 2009; Lee, Tong, & Sim, 2015). Finally, gratitude improves physical and mental health (Froh, Sefick, & Emmons, 2008) through the mediation of NFR satisfaction (Tsang, Carpenter, Roberts, Frisch, & Carlisle, 2014). These findings clearly indicate that evoking gratitude satisfies NFR.

In sum, past research has revealed that gratitude promotes people to pay it forward. However, the mechanisms underlying this process are still unknown. We conducted two

experiments to test the hypothesis that gratitude prompts individuals to pay it forward via satisfying NFR. In Study 1, we manipulated gratitude by having participants write an essay and then asking them to donate some money from their remuneration for the experiment. In Study 2, we used a different procedure to manipulate gratitude and test the hypothesis.

## Study 1

### Method

**Participants.** A total of 180 adults recruited from a crowdsourcing service (CrowdFlower) participated in an online experiment. Answers from 10 participants who did not follow the emotional manipulation instructions were excluded from the dataset. Finally, data from 170 adults (42 females;  $M_{\text{age}} = 33.36$ ,  $SD = 9.13$ ) were used in the analysis.<sup>1</sup> Each participant was instructed that they could receive remuneration (50 cents) in exchange for completing the experimental session.

### Procedure.

**Emotional manipulation.** Participants were randomly assigned to one of two conditions. In the gratitude condition ( $n = 82$ ), participants performed an emotion induction task (Ellsworth & Smith, 1988). They were asked to recall an event where they felt gratitude toward someone and to write about the details of this event on a computer. To ensure that the participants could vividly recall the event, they were instructed to report both details about the event and reasons for their emotional reactions. The recall was based on the cues, “When was the situation and what happened?” and “Why did you feel gratitude?” In the control condition ( $n = 88$ ), participants were asked to simply recall an event that happened in the last week and instructed to report details about it. The recall was based on the cues, “When was the situation and what happened?” and “Why did it happen?”

**Gratitude score.** After the writing task, the level of gratitude was measured by three items (i.e., “How appreciative do you feel now?”, “How thankful do you feel now?”, “How grateful do you feel now?”;  $\alpha = .896$ ) to check if the manipulation was successful. Other items related to emotions (such as pride, joy, and anger) were also included as filler.<sup>2</sup> Ratings for the items ranged from 1 (*not at all*) to 7 (*extremely*).

**Need for relatedness (NFR) satisfaction.** Next, participants responded to items on the connectedness scale (Pavey et al., 2011) to evaluate if the need for relatedness toward others was satisfied. The scale examines a sense of emotional bonding with others through six items (e.g., “At the present moment, I feel a bond with other people”;  $\alpha = .872$ ). Ratings for these items ranged from 1 (*strongly disagree*) to 7 (*strongly agree*).

**Prosocial behavior.** Finally, participants were instructed that they could donate money from their remuneration (50 cents) to Save the Children (<https://www.savethechildren.net/>). Then, participants decided how much money they would donate (0 to 50 cents). The amount of money they donated was used as a measure of prosocial behavior.

Upon completion of the experiment, participants were debriefed and received the entire remuneration (50 cents) regardless of their decision about the donation. Instead, the authors gave the total amount participants said they would donate to Save the Children on behalf of the participants.

## **Results and Discussion**

Participants in the gratitude condition ( $M = 5.28$ ,  $SD = 1.16$ ) felt more gratitude than those in the control condition ( $M = 4.77$ ,  $SD = 1.49$ ),  $t(168) = 2.501$ ,  $p = .013$ . Although the effect size was moderate (*Cohen's d* = .382), the emotional manipulation was successful.

Table 1 shows descriptive statistics of the variables. Contrary to the initial prediction, neither NFR satisfaction nor the amount donated was related to the emotional manipulation. These results were inconsistent with our theoretical model in which prompting gratitude through manipulation increases donation via satisfying NFR. This may be because the emotional manipulation was effective in evoking gratitude, but the effect was too small to satisfy NFR or promote a donation.

On the other hand, the relationships between the condition variable and the gratitude score ( $r = .189, p = .013$ ), the gratitude score and NFR satisfaction ( $r = .431, p < .001$ ), and NFR satisfaction and the amount donated ( $r = .238, p = .002$ ) were positively significant. These results suggested a two-step indirect path from the emotional condition variable to the promotion of donation behavior via gratitude and NFR satisfaction. To test this possibility, an indirect path analysis was performed following the guidelines of Rucker, Preacher, Tormala, and Petty (2011). R version 3.3.1 was used in the analysis. Bootstrap sampling provided a confidence interval (CI) for the indirect effect of the independent variable (condition variable) on the dependent variable (donation) via the two mediators (gratitude and NFR satisfaction). As shown in Figure 1, a bootstrap test (5,000 bootstrap samples) confirmed a marginally significant indirect effect ( $z = 1.879, p = .060, 95\% \text{ CI } [.006, .054]$ ). The result revealed that emotional manipulation evoked feelings of gratitude, which promoted donation behavior via NFR satisfaction. In other words, NFR satisfaction served as a significant intermediary between feelings of gratitude and paying it forward (i.e., donation behavior).<sup>3</sup>

In sum, Study 1 partially supported the hypothesis. The emotional manipulation promoted donation indirectly. Participants in the gratitude condition felt more gratitude. In addition, feeling gratitude increased NFR satisfaction, which in turn indirectly led to NFR-

promoted donating. These results indicate the importance of NFR in the process of paying it forward in which feelings of gratitude promote altruistic behavior toward third parties.

However, Study 1 has some limitations. In spite of the successful manipulation of gratitude, neither the condition variable nor the gratitude score directly affected the amount donated. Although Study 1 found that NFR satisfaction could bridge the gap between feelings of gratitude and donation, it is difficult to conclude that NFR satisfaction mediates the relationship between gratitude and paying it forward due to the weakness of the indirect effect. In order to resolve the issue, we conducted Study 2 using a different emotional manipulation to examine whether gratitude directly promotes donation and whether NFR satisfaction mediates the effect. We also aimed to replicate and confirm the findings of Study 1.

## Study 2

### Method

Based on the crowdsourcing worker IDs, we excluded participants who had participated in Study 1. A total of 167 adults (42 females;  $M_{age} = 32.26$ ,  $SD = 8.93$ ) recruited from a crowdsourcing service (CrowdFlower) participated in an online experiment.<sup>4</sup> The procedure and measures were the same as those in Study 1 with one exception: participants in the gratitude condition ( $n = 76$ ) wrote a letter to someone (Kruse, Chancellor, Ruberton, & Lyubomirsky, 2014). The letter was based on the cues, “Please write the initials of the person whom you felt gratitude to” and “Please write a letter of gratitude to the person as if you will actually send it.” As in Study 1, those in the control condition ( $n = 91$ ) were asked to recall an event that had happened in the last week. All participants received 50 cents as a monetary reward after finishing the experiment, which they were allowed to donate to a charity in lieu of receiving

compensation. However, in fact, the participants received full compensation at the end of the session and the donations were provided by the authors.

## Results and Discussion

As expected, participants in the gratitude condition ( $M = 5.29$ ,  $SD = 1.17$ ) felt more gratitude than those in the control condition ( $M = 4.73$ ,  $SD = 1.24$ ),  $t(165) = 3.037$ ,  $p = .003$ . Although the effect size (*Cohen's d* = .465) was moderate, the emotional manipulation was successful.

Table 2 shows descriptive statistics of the variables. As in Study 1, although neither NFR satisfaction nor the amount donated was related to the condition variable of emotional manipulation, each pair below related positively; the condition variable and gratitude score ( $r = .230$ ,  $p = .003$ ), gratitude score and NFR satisfaction ( $r = .481$ ,  $p < .001$ ), and NFR satisfaction and the amount donated ( $r = .208$ ,  $p = .007$ ). Then we examined a two-step indirect path from the emotional condition variable to the promotion of donation behavior via gratitude score and NFR satisfaction. As shown in Figure 2, a bootstrap test (5,000 bootstrap samples) confirmed a marginally significant indirect effect ( $z = 1.687$ ,  $p = .092$ , 95% CI [.004, .053]). This result replicated the finding in Study 1.

In addition, the gratitude score tended to directly predict the amount donated ( $r = .149$ ,  $p = .055$ ), which is consistent with the findings of the previous research (e.g., DeSteno et al., 2010). Then we tested whether this effect was mediated by NFR satisfaction. Mediation analysis (5,000 bootstrap samples) showed a significant indirect effect from the gratitude score to the amount donated via NFR satisfaction ( $z = 2.050$ ,  $p = .040$ , 95% CI [.017, .185]), whereas the direct effect from the gratitude score to the donation became non-significant (see Figure 3). This result indicated that NFR satisfaction fully mediated the relationship between feelings of

gratitude and donation behavior. In contrast to Study 1, the condition variable did not predict NFR satisfaction.

It should be noted that we used the gratitude score instead of the emotional manipulation to test the model of paying it forward. This procedure puts an alternative interpretation on the mediation model, such that it may simply represent the positive association between other-oriented individual differences, gratitude and NFR satisfaction, rather than an actual causal relationship between the two. However, a supplemental mediation analysis showed that the gratitude score did not mediate the relationship between NFR satisfaction and the amount donated ( $z = 0.737, p = .461$ ), which demonstrates the validity of the initial assumption based on the current model.

All in all, Study 2 replicated the model in Study 1 and confirmed its robustness by using gratitude manipulation. A direct causal relationship was found between feelings of gratitude and charitable donation, and NFR satisfaction fully mediated this relationship. The result is consistent with our hypothesis that gratitude satisfies NFR, which in turn promotes prosocial behavior.

### **General Discussion**

In our daily lives, we often feel gratitude, which is necessary for bonding and for smoothing out our interpersonal interactions (McCullough et al., 2001). Gratitude promotes not only direct reciprocity but also upstream reciprocity, often known as “paying it forward” (Bartlett & DeSteno, 2006). Past research has used indirect indices of prosociality, such as support intention, costly helping, and cooperative choices in social dilemmas, and presumed a simple causal process in which gratitude directly facilitates paying it forward. In this study, we

measured the amount donated to charity as a first-hand index of prosocial behavior toward strangers and hypothesized that NFR satisfaction mediates the relationship between feelings of gratitude and prosocial behavior. Two online experiments revealed that feelings of gratitude promoted donation behavior via NFR satisfaction. In particular, Study 2 showed that feelings of gratitude increased the amount of a charitable donation, and that the effect was mediated by NFR satisfaction. These results support our hypothesis and clarify the mechanism underlying the process where evoking gratitude promotes paying it forward.

Although previous literature has revealed that gratitude directly promotes prosociality (Bartlett & DeSteno, 2006), the current study proved that NFR mediates the process. Why does this motivational factor act as a bridge? One possible interpretation is that NFR supports a process in which feelings of gratitude increase the adaptiveness of individuals by expanding their social networks. A study of undergraduate social networks (Chang, Lin, & Chen, 2012) found that students high in trait gratitude tend to give frequent support to others and be located in the central position of a support network as a consequence of manifold nominations from their beneficiaries. From the perspective of NFR, grateful people are not merely benevolent toward others. They carry out paying it forward to achieve their motivation to connect with others, and consequently acquire a central position in a social network by cultivating many social ties that increase their adaptiveness in the long term through the process of indirect reciprocity. Although the current study only examined donation behavior toward strangers, feelings of gratitude stimulate NFR, and could broaden our social networks. Future studies should examine how gratitude expands social networks in more ecologically valid situations.

NFR could mediate not only the relationship between gratitude and paying it forward, but also between gratitude and forgiveness, a suite of prosocial motivational changes that occur after

a person has incurred a transgression (McCullough, 2001). Previous research found a positive association between trait gratitude and a forgiving disposition (Toussaint, & Friedman, 2009). People also tend to forgive others' fault after writing about their important and close relationship as an experimental manipulation to satisfy the desire to connect with others (Barnes, Carvallo, Brown, & Osterman, 2010). Considering the evidence, we can infer that gratitude satisfies NFR and, in turn, leads us to forgive others. The current model has the potential to provide an integrated framework that explains separate findings about gratitude from the viewpoint of other-oriented motivation.

There are several limitations in the present study. First, we could not observe a direct effect of emotional manipulation on NFR satisfaction nor on donation behavior in either study. These results were inconsistent with previous studies and with our initial prediction. One possible cause is the experimental setting. In contrast to previous studies which gave actual benefits to participants, we used a simple emotional manipulation which just asked them to write an essay (Study1) or a letter (Study2) of gratitude. It is possible that this difference caused the lack of direct effect in this study. One way to resolve this issue is to strengthen the validity of the experimental situations. Bartlett and DeSteno (2006) had participants and confederates complete a hand-eye coordination task in three different conditions. In the gratitude condition, participants' computer screens suddenly went blank after the tasks were completed. Subsequently, the experimenter asked the participants to redo the task, as the data would be deleted due to the computer blackout. After these manipulations, the confederate fixed the computer and saved the data. The procedure succeeded in evoking strong feelings of gratitude among participants toward the confederate. Ecological validity of experimental settings is crucial to increasing the applicability of desktop theories to our daily lives. Future research on gratitude

should test a process of paying it forward in a laboratory setting that involves face-to-face interpersonal interaction. Finally, we did not measure other positive emotions and related psychological variables (e.g., empathic concern, social desirability) that could promote a charitable donation. There remains the possibility that these factors were evoked by the emotional manipulation and that they increased the amount of participants' donations. Future research should examine the robustness of the current findings while controlling for these factors.

In summary, this study has demonstrated that NFR mediates the effect of gratitude on paying it forward. Paying it forward, repaying the kindness to a stranger but not to one's beneficiary, appears at first glance to be a strange behavior. However, considering the motivation, caused by gratitude, to connect with other people, it becomes a rational action. This unique model including NFR is able to integrate previous findings and suggest other potential effects of gratitude. Based on these findings, we propose the possibility that gratitude is a highly social emotion which not only deepens the relationship with a benefactor but also broadens the social network by increasing the motivation to connect with others.

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## References

- Algoe, S. B., Gable, S. L., & Maisel, N. C. (2010). It's the little things: Everyday gratitude as a booster shot for romantic relationships. *Personal Relationships, 17*, 217-233. doi: 10.1111/j.1475-6811.2010.01273.x
- Algoe, S. B., Haidt, J., & Gable, S. L. (2008). Beyond reciprocity: Gratitude and relationships in everyday life. *Emotion, 8*, 425-429. doi: 10.1037/1528-3542.8.3.425
- Barnes, C., Carvallo, M., Brown, R., & Osterman, L. (2010). Forgiveness and the need to belong. *Personality and Social Psychology Bulletin, 36*, 1148-60. doi:10.1177/0146167210378852
- Bartlett, M. Y., & DeSteno, D. (2006). Gratitude and prosocial behavior: Helping when it costs you. *Psychological Science, 17*, 319-325. doi: 10.1111/j.1467-9280.2006.01705.x
- Chang, Y.-P., Lin, Y.-C., & Chen, L. (2012). Pay it forward: Gratitude in social networks. *Journal of Happiness Studies, 13*, 761-781. doi:10.1007/s10902-011-9289-z
- DeSteno, D., Bartlett, M. Y., Baumann, J., Williams, L. A., & Dickens, L. (2010). Gratitude as moral sentiment: Emotion-guided cooperation in economic exchange. *Emotion, 10*, 289-293. doi: 10.1037/a0017883
- DeWall, C. N., Lambert, N. M., Pond, R. S., Kashdan, T. B., & Fincham, F. D. (2012). A grateful heart is a nonviolent heart: Cross-sectional, experience sampling, longitudinal, and experimental evidence. *Social Psychological and Personality Science, 3*, 232-240. doi: 10.1177/1948550611416675
- Ellsworth, P. C., & Smith, C. A. (1988). Shades of joy: Patterns of appraisal differentiating pleasant emotions. *Cognition and Emotion, 2*, 301-331. doi:10.1080/02699938808412702

- Ferrer, R. A., Grenen, E. G., & Taber, J. M. (2015). Effectiveness of internet-based affect induction procedures: A systematic review and meta-analysis. *Emotion, 15*, 752-762. doi.org/10.1037/emo0000035
- Froh, J. J., Sefick, W. J., & Emmons, R. A. (2008). Counting blessings in early adolescents: An experimental study of gratitude and subjective well-being. *Journal of School Psychology, 46*, 213-233. doi:10.1016/j.jsp.2007.03.005
- Gordon, A. M., Impett, E. A., Kogan, A., Oveis, C., & Keltner, D. (2012). To have and to hold: Gratitude promotes relationship maintenance in intimate bonds. *Journal of Personality and Social Psychology, 103*, 257-274. doi:10.1037/a0028723
- Jia, L., Lee, L. N., & Tong, E. M. W. (2015). Gratitude facilitates behavioral mimicry. *Emotion, 15*, 134–138. doi.org/10.1037/emo0000022
- Joel, S., Gordon, A. M., Impett, E. A., Macdonald, G., & Keltner, D. (2013). The things you do for me: Perceptions of a romantic partner's investments promote gratitude and commitment. *Personality and Social Psychology Bulletin, 39*, 1333-1345. doi:10.1177/0146167213497801
- Kashdan, T. B., Mishra, A., Breen, W. E., & Froh, J. J. (2009). Gender differences in gratitude: Examining appraisals, narratives, the willingness to express emotions, and changes in psychological needs. *Journal of Personality, 77*, 691-730. doi:10.1111/j.1467-6494.2009.00562
- Kim, S., & Lee, J. S. (2013). Is satisfaction enough to ensure reciprocity with upscale restaurants? The role of gratitude relative to satisfaction. *International Journal of Hospitality Management, 33*, 118-128. doi:10.1016/j.ijhm.2012.06.009

Lee, L.-N., Tong, E. M. W., & Sim, D. (2015). The dual upward spirals of gratitude and basic psychological needs. *Motivation Science, 1*, 87-97. doi:10.1037/mot0000018

McCullough, M. (2001). Forgiveness: Who does it and how do they do it? *Current Directions in Psychological Science, 10*, 194–197. doi:10.1111/1467-8721.00147

McCullough, M. E., Kilpatrick, S. D., Emmons, R. A., & Larson, D. B. (2001). Is gratitude a moral affect? *Psychological Bulletin, 127*, 249-266. doi: 10.1037//0033-2909.127.2.249.

McCullough, M. E., Kimeldorf, M. B., & Cohen, A. D. (2008). An adaptation for altruism: The social causes, social effects, and social evolution of gratitude. *Current Directions in Psychological Science, 17*, 281-285. doi: 10.1111/j.1467-8721.2008.00590

Moller, A. C., Deci, E. L., & Elliot, A. J. (2010). Person-level relatedness and the incremental value of relating. *Personality and Social Psychology Bulletin, 36*, 754–767. doi: 10.1177/0146167210371622

Nowak, M. A., & Roch, S. (2007). Upstream reciprocity and the evolution of gratitude. *Proceedings of the Royal Society of London B: Biological Sciences, 274*, 605-610. doi: 10.1098/rspb.2006.0125

Pavey, L., Greitemeyer, T., & Sparks, P. (2011). Highlighting relatedness promotes prosocial motives and behavior. *Personality and Social Psychology Bulletin, 37*, 905-917. doi: 10.1177/0146167211405994

Prentice, M., & Sheldon, K. M. (2015). Priming effects on cooperative behavior in social dilemmas: Considering the prime and the person. *Journal of Social Psychology, 155*, 163-181. doi:10.1080/00224545.2014.977763

- Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation analysis in social psychology: Current practices and new recommendations. *Social and Personality Psychology Compass, 5*, 359-371.
- Ryan, R. M., Huta, V., & Deci, E. L. (2008). Living well: A self-determination theory perspective on eudaimonia. *Journal of Happiness Studies, 9*, 139–170. doi: 10.1007/s10902-006-9023-4
- Simmel, G. (1950). *The sociology of Georg Simmel*. K. H. Wolff (Trans., Ed.). Glencoe, IL: The Free Press.
- Tesser, A., Gatewood, R., & Driver, M. (1968). Some determinants of gratitude. *Journal of Personality and Social Psychology, 9*, 233-236. doi: 10.1037/h0025905
- Toussaint, L., & Friedman, P. (2009). Forgiveness, gratitude, and well-being: The mediating role of affect and beliefs. *Journal of Happiness Studies, 10*, 635-654. doi:10.1007/s10902-008-9111-8
- Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology, 46*, 35-57. doi: 10.1086/406755
- Tsang, J. A. (2006). The effects of helper intention on gratitude and indebtedness. *Motivation and Emotion, 30*, 198-204. doi: 10.1007/s11031-006-9031-z
- Tsang, J. A., Carpenter, T. P., Roberts, J. A., Frisch, M. B., & Carlisle, R. D. (2014). Why are materialists less happy? The role of gratitude and need satisfaction in the relationship between materialism and life satisfaction. *Personality and Individual Differences, 64*, 62-66. doi:10.1016/j.paid.2014.02.009
- Wood, A. M., Froh, J. J., & Geraghty, A. W. (2010). Gratitude and well-being: A review and theoretical integration. *Clinical Psychology Review, 30*, 890-905. doi:10.1016/j.cpr.2010.03.005



## Footnotes

<sup>1</sup>Nationalities of participants in Study 1 are: African (1.7%), Asian (26.4%), Australian/Pacific Islander (2.8%), European (48.3%), North American (9.0%), South American (8.4%), and unknown (3.4%). Ethnicities are: Caucasian (46.1%), Hispanic (9.6%), Asian (28.1%), African American (1.1%), and other (15.2%).

<sup>2</sup>There was no significant difference in the scores of the filler items (Pride:  $t(168) = 0.852$ ,  $p = .395$ ; Anger:  $t(168) = 0.638$ ,  $p = .524$ ; Joy:  $t(168) = 0.144$ ,  $p = .886$ ) between the two conditions.

<sup>3</sup>The condition variable had a marginally negative effect on NFR satisfaction in the path analysis, although there was no significant relationship between these variables in the correlational analysis (Table 1). Because it is difficult to explain the effect from our theoretical framework, and the finding is not replicated in the next study, we do not interpret it in detail.

<sup>4</sup>Nationalities of participants in Study 2 are: African (2.3%), Asian (16.1%), Australian/Pacific Islander (0.6%), European (67.8%), North American (6.3%), South American (3.4%), and unknown (3.4%). Ethnicities are: Caucasian (60.9%), Hispanic (7.5%), Asian (16.7%), African American (5.7%), and other (14.4%).

Table 1

*Descriptive statistics and correlations (Study 1)*

	<i>M</i>	<i>SD</i>	<i>α</i>	1	2	3
1. Condition (0 = Control, 1 = Gratitude)	-	-	-	-		
2. Gratitude Score	5.02	1.36	.896	.189*	-	
3. NFR Satisfaction	5.14	0.92	.872	-.032	.431***	-
4. Amount of Donation (cents)	14.52	14.52	-	.091	.122	.238**

*Note.*  $N = 170$ , \*\*\*  $p < .001$ . \*\*  $p < .01$ . \*  $p < .05$ .

Table 2

*Descriptive statistics and correlations (Study 2)*

	<i>M</i>	<i>SD</i>	<i>α</i>	1	2	3
1. Condition (0 = Control, 1 = Gratitude)	-	-	-	-		
2. Gratitude Score	4.98	1.23	.872	.230**	-	
3. NFR Satisfaction	4.99	0.91	.808	.124	.481***	-
4. Amount of Donation (cents)	18.57	17.37	-	.004	.149†	.208**

*Note.*  $N = 167$ , \*\*\*  $p < .001$ . \*\*  $p < .01$ . †  $p < .10$ .

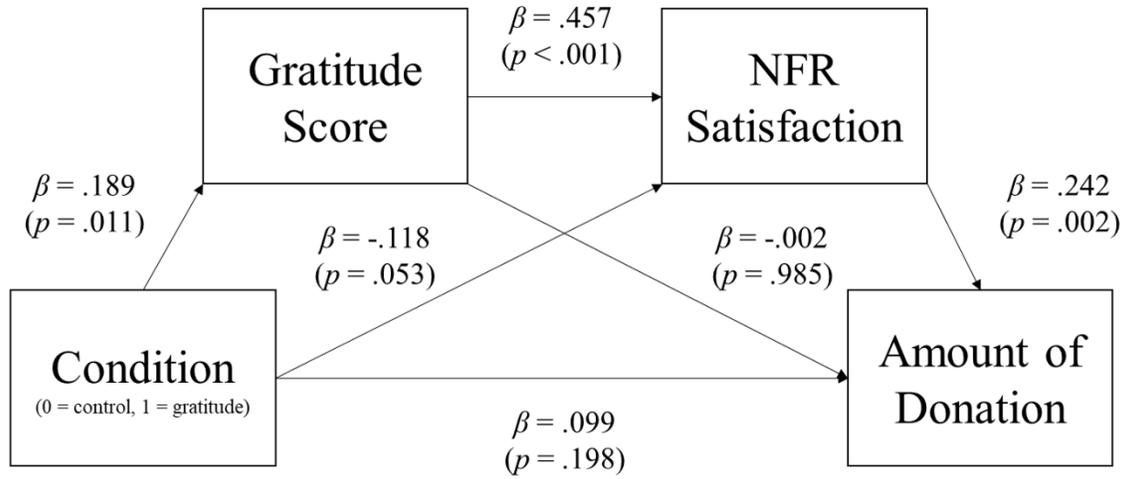


Figure 1 Indirect effect of the emotion condition on donation via gratitude and NFR satisfaction (Study 1).

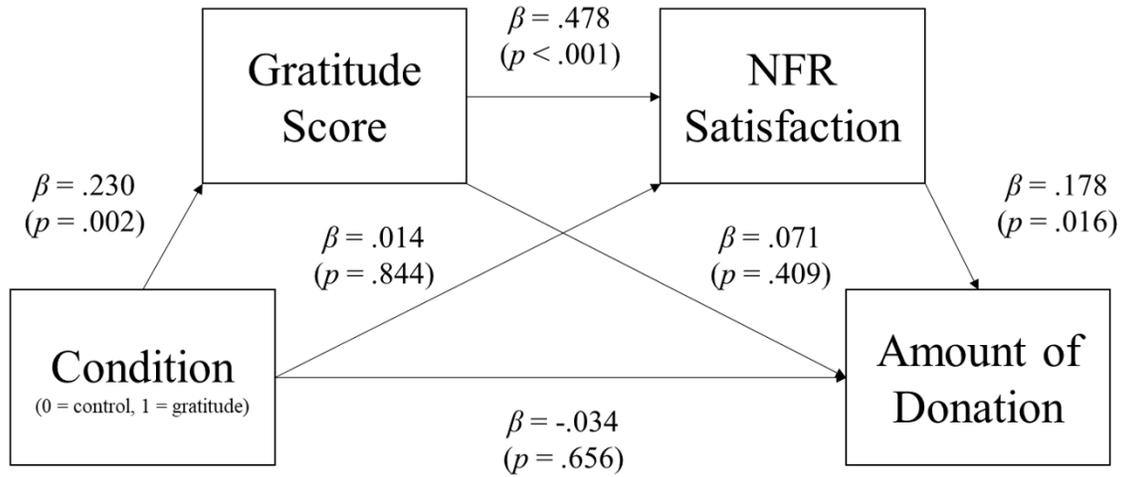


Figure 2 Indirect effect of the emotion condition on donation via gratitude and NFR satisfaction (Study 2).

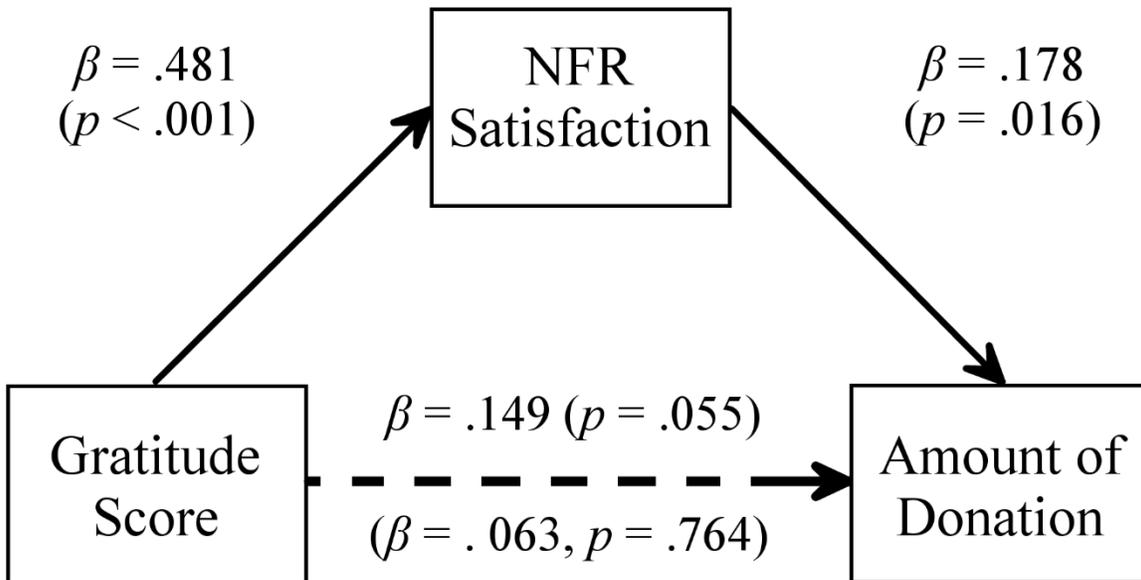


Figure 3 Mediation effect of gratitude on donation via NFR satisfaction (Study 2).