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TO HELP OR NOT TO HELP? ASSESSING THE IMPACT OF ENVY AND GRATITUDE
ON PROSOCIAL BEHAVIORS

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
at Virginia Commonwealth University

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Abstract

TO HELP OR NOT TO HELP? ASSESSING THE IMPACT OF ENVY AND GRATITUDE ON PROSOCIAL BEHAVIORS

By Anna Maria C. Behler, M.A., M.S.

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
at Virginia Commonwealth University.

Virginia Commonwealth University, 2017

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Envy is an other-oriented but negative emotion; no research has examined the influence of envy on prosocial behavior. Study 1 examined whether envy and gratitude would promote or inhibit prosocial behavior. I hypothesized that envy would result in less helping behavior than a neutral condition, whereas gratitude would increase helping behavior. Results supported the hypothesis that envy inhibits prosocial behavior. There was not enough evidence to suggest that gratitude promoted helping.

Study 2 examined how envy and gratitude affected prosocial behavior when participants were given the choice to help or harm others. I hypothesized that experiencing envy would result in greater likelihood of engaging in harmful behavior, but that gratitude would promote more helpful behavior, even when it meant a less positive outcome for participants. The hypothesis

that envy increases harming behavior was supported, while there was not enough evidence to suggest that gratitude promoted helping behavior in this scenario.

To Help or Not to Help? Assessing the Impact of Envy and Gratitude on Prosocial Behaviors

“Be content with what you have;
rejoice in the way things are.
When you realize there is nothing lacking,
the whole world belongs to you.”

- *Lao Tzu, Tao Te Ching*

“When men are full of envy they disparage everything,
whether it be good or bad.”

- *Tacitus*

Gratitude & Envy: The Relevance of the “Other-Focus”

Emotions are temporary affective states that involve a complex web of responses in an individual, including changes in one’s cognition and behavioral responses. As such, emotions can have a significant impact on the way individuals perceive the world around them as well as how they behave. These changes in thinking and behavior can affect the ways in which people view and interact with others, and this can become especially important to understand when encountering another person who is in need.

Imagine for a moment that two employees at a company are interviewing for the same position. When it is announced that Employee 1 was selected for the role, he might feel grateful to his employers for having given him the promotion, to his company for providing him with advancement opportunities in his career, or even thankful for his own ability to perform successfully at work. Meanwhile, the second employee may begin to feel envious and actually believe that he was better suited for the position, and thus more deserving. He may begin to experience negative feelings directed at Employee 1, even secretly hoping that Employee 1 does not perform well in the role. How might these feelings affect Employee 2’s behavior at work and

as a member of his team? It is likely that this emotional experience might have negative ramifications for Employee 2 that extend beyond his own thoughts, even affecting his work performance and co-worker relationships. Although gratitude and envy may seem like polar opposites at first, principally due to their opposing valence, these emotions actually share important elements that affect daily life.

Gratitude: Benefits for the Self and Others

The gratitude Employee 1 is experiencing can be separated into two components: first, this feeling serves as a positive affirmation that we are benefitting from goodness in the world. Secondly, gratitude is an externally focused emotion, in that it stems from a recognition that this goodness comes from external sources. These external sources of goodness can take many forms, such as close others, the environment, a higher power, or even strangers (Emmons & McCullough, 2003).

There are a number of positive outcomes associated with experiencing gratitude. Gratitude has been shown to strongly correlate with overall psychological well-being ($r = .65, p < .001$) and shares a moderate inverse relationship with depression ($r = -.31, p < .001$; Lin, 2015). Gratitude is also strongly correlated with overall life satisfaction ($r = .69, p < .01$; Froh, Emmons, Card, Bono, & Wilson, 2011). Given the number of favorable outcomes associated with gratitude, it comes as no surprise that having a grateful disposition is correlated with positive affect ($r = .31$, Froh, Fan, Emmons, Bono, Huebner, & Watkins, 2011). Gratitude has also been found to increase relationship satisfaction and feelings of connectedness within romantic couples (Algoe, Gabel, & Maisel, 2010), indicating that this emotion plays a role in our perceptions of others, as well as in the interactions that follow.

In addition to inducing positive feelings within and between individuals, it has also been noted through previous research that gratitude is positively linked to prosocial tendencies. In fact, gratitude is seen as a central factor in creating a supportive and thriving social network around us from an evolutionary perspective, because it fosters connection and encourages reciprocity between individuals (Algoe, Kurtz, & Hilaire, 2016). This link has been further established experimentally in several studies, even when the personal cost of helping was manipulated to be greater (Bartlett & DeSteno, 2006). In another series of studies, it was found that increased feelings of self-efficacy and self-worth serve as the underlying mechanisms for engaging in prosocial behavior (Grant & Gino, 2010). The relationship between gratitude and helping behavior has also been widely noted amongst males ($r = .29, p < .01$) and females ($r = .23, p < .01$; Tian, Du, & Huebner, 2015), across cultures ($r = .34, p < .001$; Li & Chow, 2015), and across age groups ($r = .30, p < .001$; Froh, Bono, & Emmons, 2010).

These associations are consistent with the broaden-and-build theory (Fredrickson, 1998, 2001), which proposes that positive emotions increase one's scope of attention. It is possible that higher levels of gratitude may allow one to notice that someone else is in need of help, thus increasing the chances of actually performing helping behavior. They are also consistent with a second theory, deemed the "find-remind-and-bind theory", which posits that gratitude is essential from an evolutionary perspective, in that it is one of the most important factors by which we form and maintain relationships with people we interact with most often in romantic and non-romantic contexts (Algoe, 2012). Experiencing gratitude serves as a signal for individuals when seeking out (or "finding") others who will be suitable relationship partners and results in attempts to bond to them. Although the following studies will be examining interactions between strangers rather than close others, the find-remind-and-bind theory is still applicable in this

context, as being in a grateful state should serve as a motivation to help others in these experimental contexts.

Envy: A Search for What's Missing

Like gratitude, envy is also an externally focused emotion, except that it involves negative feelings directed at an outside source. Unlike gratitude, in which we are positively evaluating things we possess or experience, the negative state associated with envy stems from a wish to attain elements we feel are lacking in our lives. It could be another person's qualities, achievements, or possessions that we desire, or even wish for them to lack (Parrot & Smith, 1993). In the anecdote above, Employee 2 clearly desires the promotion that his co-worker received.

This sense of lacking is often accompanied by other negative affective components. For example, hostility has long since been identified as an underlying component of envy (Silver & Sabini, 1978; Smith & Kim, 1997). Other research has also provided evidence to suggest that envy is positively correlated with feelings of inferiority ($r = .36, p < .001$; van de Ven, Hoogland, Smith, van Dijk, Breugelmans, & Zeelenberg, 2015) and depressiveness ($r = .39, p < .001$; Appel, Crusius, & Gerlach, 2015).

However, it was not until recently that envy was further subdivided into two components—malicious and benign. The emotion of benign envy focuses on an object or attribute as the source of its desire, and involves feelings of aspiration towards attaining that object or attribute for oneself. Malicious envy has a far more negative valence: it focuses on a specific person and involves ill will towards the individual (van de Ven, Zeelenberg, & Pieters, 2009). In fact, experimental research has shown that these two different emotions result in a

change in our cognition, such that our attentional resources are diverted towards varying elements depending upon which type of envy we are experiencing. Using a dot probe task, Crusius and Lange (2014), found that people were more likely to direct their attention toward an envied target when experiencing malignant envy, ultimately resulting in a reduction in their overall performance. However, those experiencing benign envy were more likely to focus on the task at hand.

Recently, there has been a debate over whether envy should be studied as two distinct constructs or a single, unified concept (Cohen-Charash & Larson, 2017). However, the findings regarding benign and malicious envy were further corroborated by recent research showing that students who exhibit high levels of benign envy as a personality trait had a propensity to set higher goals for themselves, and thus tended to perform better academically relative to their counterparts who were higher in levels of malicious envy (Sawada & Fujii, 2016). Given that benign envy seems to be more self-focused, the studies presented in this thesis will focus specifically on the malignant subtype of envy and its role in prosocial behaviors.

Envy, Gratitude, & Their Relationship to Prosocial Behaviors

Unlike the numerous findings surrounding gratitude and prosocial behavior, the relationship between envy and helping has not been as well-documented. However, previous research has found a relationship between malicious envy and schadenfreude, or taking pleasure in the misfortune of others ($r = .49, p < .001$; van de Ven et al., 2015). In this correlational study, van de Ven et al. found evidence that malicious envy predicted greater dislike of a target, as well as an increased tendency to feel that a target deserved to suffer a minor setback. In addition,

gratitude and envy were negatively correlated with one another ($r = -.35, p < .01$; Froh, Emmons, Card, Bono, Wilson, 2011) in the only such study of which we are aware.

The affective experience of envy described here is clearly very different than that of gratitude, and thus when considered together, past work hints at the possibility that, unlike gratitude, envy may actually inhibit helping behavior. Negative emotions have been found to narrow an individual's scope of attention (Fredrickson & Branigan, 2005), so a decrease in helping behavior is likely given this decrease in attentiveness. However, negative emotions also have been found to increase helping behavior under some circumstances, possibly as a means of mood repair (Cialdini & Kenrick, 1976). The following studies will attempt to bridge this gap in the literature by first examining whether envy inhibits prosocial behavior, and also whether it also increases harmful behavior.

Overview of Study 1

The first purpose of Study 1 was to explore whether envy promotes or inhibits prosocial behavior, given the conflicting research regarding negative emotions and helping. A second aim of the first study was to compare gratitude and envy regarding their impact on prosocial behavior. This research is novel in that envy and gratitude have not yet been explored experimentally in relationship to helping behavior, as much of the above cited literature has focused on self-reports and correlational data. In addition, researchers have not yet explored envy and gratitude together as having shared properties, a perspective which could greatly enhance our understanding of these two emotions.

In this study, participants completed measures of dispositional envy, trait gratitude, and self-esteem. Participants were induced into a grateful, envious, or neutral state, and then had an opportunity to engage in prosocial behavior. (See Section II - Methods for a full description of the research design and procedure.) If the following hypotheses are supported, this research will improve our overall understanding of the emotion of envy. More specifically, it will offer evidence to show that envy can have detrimental effects not only on the individual, but on interpersonal interactions, even among strangers.

Hypotheses

Based upon previous research findings, I predicted that there would be a significant effect of envy and gratitude on helping behavior in the present study and wanted to test this effect in two different ways. More specifically, in keeping consistent with Frederickson's broaden-and-build hypothesis, I believed that (1a) envy would inhibit helping behavior during the helping

scenario, such that participants in the envy condition would be less likely to offer help relative to a neutral condition (measured as a dichotomous outcome: helped or did not help). (1b) Second, I predicted that of all participants, those exposed to the envy induction would offer significantly less help overall (measured by the number of pencils picked up) as compared to individuals in the neutral condition. (2a) I also predicted that gratitude would promote helping behavior, so that participants in the gratitude condition would be more likely to offer help relative to the neutral condition, and that (2b) those in the gratitude condition would pick up a significantly greater number of pencils relative to the neutral condition.

Method

Sample

Data was collected from 143 participants, all of whom were English-speaking undergraduate students at Virginia Commonwealth University (VCU), a large, urban university. Participants signed up through SONA, VCU's online research system. All participants received partial course credit for their participation. However, a number of participants had to be excluded for the following reasons: they reported suspicions about the hypotheses ($n = 2$), they failed the inattention checks that were included in the survey ($n = 1$), or there were issues encountered during the pencil drop scenario ($n = 20$). Regarding the last reason on this list, the experimenters were instructed to indicate whether there were any issues that that may have occurred, such as the pencils falling in the wrong direction, not falling out of the cup, or in one case, being blocked inadvertently by a participants' personal belongings. Any issues like the ones listed here resulted in that participants' data being excluded, because this prevented an accurate measurement of the dependent variable. Therefore, the final sample consisted of 117 participants.

The sample was largely female (29.9% male, 69.2% female, < 1% other). However, participants' self-reported racial identification was more diverse and better represented that of the overall VCU student population: 49.6% Caucasian, 25.6% African-American/Black, 12.8% Asian, 9.4% Hispanic/Latino, and 1.7% identified as Other.

Research Design

This study was a one-way between subjects factorial design because there were three levels of the independent variable. The participants were exposed to an envy induction ($n = 38$), a gratitude induction ($n = 41$), or a neutral induction ($n = 38$). The outcome measures were whether the participants offered help during the helping scenario (recorded as a dichotomous variable, either Helped or Did Not Help), and how many pencils were picked up (measured as a continuous variable).

Procedure

Consent Process. Individuals who agreed to participate signed a consent form. All participants were told at the beginning of the session that the study involves three parts: a series of personality questionnaires, an emotion writing task to be completed individually, and then a writing task with a same-sex partner (a confederate). The experimenter explicitly mentioned that the partner would also be an introductory psychology student in order to increase the perception of similarity between the participant and the confederate. Mentioning this fact and having the partner be of the same sex were intentional, as greater perceived similarity increases the likelihood that participants would view the confederate as a target for social comparison, making

the hypothesized envy and gratitude effects even more salient (Thornton & Arrowood, 1966; van Dijk, Ouwerkerk, Goslinga, Nieweg, and Galluci, 2006; Wood, 1989).

Measures. All participants were asked to complete four self-report measures (see Appendices). First, trait gratitude was measured using the Gratitude Questionnaire Six-Item Form (GQ-6, $\alpha = .82$; McCullough, Emmons, & Tsang, 2002). The items include statements such as “*I am grateful to a wide variety of people*” and “*When I look at the world, I don’t see much to be grateful for.*” Participants responded using a 7-point Likert-type scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Second, trait envy was measured using the Benign and Malicious Envy Scale (BeMaS; Lange & Crusius, 2015). The scale consists of ten self-report items, such as “*Envyng others motivates me to accomplish my goals.*” and “*I feel ill will towards people I envy.*” All items are rated on a 6-point Likert-type scale, ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

Third, general prosocial attitudes were assessed using a 9-item scale (adapted from Osgood & Muraven, 2015, $\alpha = .76$). The scale consists of items such as “*The needs of others are important.*” and “*It is important that others are happy.*” All items are rated on a 5-point Likert-type scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Finally, participants completed the Rosenberg Self-Esteem Scale ($\alpha = .88$, R-SES; Rosenberg, 1965). The scale consists of ten items such as “*On the whole, I am satisfied with myself.*” And “*I am able to do things as well as most people.*” Items are rated on a 1 (*strongly agree*) to 4 (*strongly disagree*) scale.

Induction. After the self-report measures, participants were randomly assigned to one of three conditions (envy, gratitude, or neutral). The experimenter told participants that the

researchers were interested in how vividly people could recall emotional events. Participants were then asked to close their eyes and visualize the details and experiences of a specific emotional event related to their assigned condition.

In the envy condition, participants were given the following instructions: *“Close your eyes and take one full minute to reflect on an event that caused you to feel very envious. Focus on your emotional reaction to the situation.”* Participants will be given one minute to reflect on this scenario, and will then be provided with the following instructions: *“Please spend the next ten minutes writing about that time, providing as many details about the situation as possible.”* Participants were provided with the following definition of envy to ensure a common understanding of the term: *“Envy is a negative feeling or emotional state that results from a desire to have the possessions, achievements, or qualities of another for yourself”* (adapted from Barrows, 2002).

In the gratitude condition, participants were given same prompt, but with the word “grateful” in place of “envious”: *“Close your eyes and take one full minute to reflect on an event that caused you to feel very grateful. Focus on your emotional reaction to the situation.”* Participants will be given one minute to reflect on this scenario, and will then be provided with the following instructions: *“Please spend the next ten minutes writing about that time, providing as many details about the situation as possible.”* Participants were also provided with the following definition of gratitude to ensure a common understanding of the term: *“Gratitude is a positive feeling or emotional state that results from recognizing sources of goodness in others and the benefits you have received from others”* (adapted from Emmons & McCullough, 2003).

In the neutral condition, participants were given a slightly different prompt: *“We tend to have many interactions each day. Close your eyes and take one full minute to reflect on the last*

time you had a normal interaction with a salesperson. This should be a typical interaction, and not one in which anything out of the ordinary happened. Focus on your reactions during the interaction.” Participants will be given one minute to reflect on this scenario, and will then be provided with the following instructions: *“Please spend the next ten minutes writing about that time, providing as many details about the situation as possible.”* This prompt was intended to have participants complete a recall task similar to individuals in the other conditions in that it involved a memory with a social component, but without invoking a specific emotion.

Helping Scenario. The scenario described below was adapted from Twenge, Baumeister, DeWall, Ciarocco, & Bartels (2007). Following the induction, the experimenter informed the participant that his or her interaction partner would now be joining him/her to complete the second task. The room was set up so that there was a cup of pencils on the desk where the second participant would be directed to sit. When both participants were seated, the experimenter said, *“I forgot the sheet you will need to fill out. I’ll be right back.”* At this time, the experimenter left the room, but waited in the hallway just outside out of the participant’s line of sight. After a few seconds of waiting, the actor knocked the cup of pencils over and then began to pick them up. The actors were trained to pick up the pencils slowly enough to allow time for the participant to offer help, but still quickly enough to be realistic. When the experimenter came back into the study room, they handed the participant and the confederate individual forms to fill out. The participant’s form contained manipulation check items (see section below). The confederate’s form was used to assess the participant’s helping behavior at this time, measuring it as both a dichotomous variable (helped or did not help) and as a continuous variable (how many pencils were picked up).

Manipulation Check. The manipulation check took place following the helping scenario. This part of the study was completed at this point rather than immediately following the emotion-recall writing task for a number of reasons. Firstly, this was done so that the effects of the manipulation would be as salient as possible during the helping scenario, and similar reasoning has been presented in previous research (Kidd, 1976). Secondly, this also increased the study's face validity, as the experimenter returned with forms for the participant and confederate to fill out, presumably as a part of the second writing task they had consented to at the beginning of the study. Finally, the manipulation check questions were phrased such that they assessed how participants felt at the time that the emotional event took place, rather than their current feelings, so as to ensure that participants had followed directions and recalled a memory that was appropriate to the emotional definition they had been provided.

After approximately one minute, the experimenter returned to the room and provided the participant and actor the following instructions, *"Please respond to the following statements about the scenario you wrote about earlier."* Participants then responded to the following 6 items (adapted from a gratitude manipulation check used in Bartlett & DeSteno, 2006): 1) *"At the time, how bitter/resentful did you feel towards the person?"* 2) *"At the time, how envious did you feel of the person?"*, 3) *"At the time, how negative did you feel towards the person?"* 4) *"At the time, how grateful did you feel towards the person?"* 5) *"At the time, how appreciative did you feel towards the person?"* and 6) *"At the time, how positive did you feel towards the person?"* All of these questions are rated on a scale of 1 (*Not at all*) to 5 (*Extremely*).

After the participant completed this final measure, the experimenter debriefed them about the true nature of the experiment, and then had the participant complete a demographic questionnaire (e.g., age, sex, and race information).

Results

Manipulation Check

I assessed the success of the manipulation in two ways. First, the subjective ratings that had been provided by each participant were examined for reported affective differences between conditions. First, I calculated the mean of first three items of the manipulation check (envy manipulation check subscale) and the last three items (gratitude manipulation check subscale). Then, I used a One-Way MANOVA to assess if there were differences between the subjective ratings across conditions. Results suggested that participants differed significantly on both the envy $F(2, 114) = 99.61, p < .001, \eta^2 = .636$ and gratitude $F(2, 114) = 49.39, p < .001, \eta^2 = .464$. subscales across the three conditions. A Tukey post-hoc analysis was conducted to determine the direction of the differences. Participants in the envy condition ($M = 3.48, p < .001$) reported significantly higher envy scores relative to both their grateful ($M = 1.20, p < .001$) and neutral counterparts ($M = 1.37, p < .001$). The latter two groups did not differ significantly from one another on the envy subscale. On the gratitude subscale, I found that all three groups differed significantly from one another, with the gratitude condition reporting the highest scores on this measure ($M = 4.62, p's < .001$). It was also noteworthy that participants in the neutral condition ($M = 3.40, p < .001$) reported significantly higher feelings of gratitude relative to the envy group.

Then, two independent raters who were blind to the conditions coded each of the narratives written by the participants, using an adapted version of the same scale that participants had completed. All of the same items from the original scale were included, but were written such that they asked the raters to assess how much the participant seemed to exhibit each feeling in the narrative. The items were again rated on a 1 to 5 scale.

A very high degree of reliability was found between raters on each of the manipulation check measurements. For the envy manipulation, the Interclass Correlation Coefficient (2, 2) = .930, 95% CI = .899 to .952 $F(116, 116) = 14.32, p < .001$). For the gratitude manipulation, the ICC (2,2) = .954, 95% CI = .934 to .968, $F(116,116) = 21.70, p < .001$). From these analyses, we can conclude that the manipulation was successful.

Hypothesis 1

I used a logistic regression to address the hypothesis that participants in the envy condition would be the least likely to exhibit helping behavior relative to the other conditions. The independent variable was the condition (gratitude, envy, or neutral). The outcome measure was whether the participants offered help during the helping scenario (recorded as a dichotomous variable, either Helped or Did Not Help). This analysis was run using an alpha level of .05.

The assumptions that needed to be met to run a logistic regression were that (1) the criterion variable was measured on a dichotomous scale, (2) there was a continuous predictor variable, (3) all observations are independent from one another, and (4) there is a linear relationship between the independent variables and the logit transformation of the dependent variable. Assumptions 1, 3, and 4 were verified prior to running the analysis. The predictor variable was not continuous and had more than two levels, therefore dummy-coding was used in order to run the analysis appropriately.

Based on a classification threshold predicted probability of target group membership of .5, the overall model was statistically significant, $\chi^2(2) = 15.01, p = .001$. This indicated that the likelihood of whether one would choose to help or not could be accurately predicted based on the condition to which they were assigned (See Table 1). Classification success for the cases based

on a classification cutoff value of .5 for predicting helping behavior was high, with an overall prediction success rate of 92.3%. Nagelkerke's pseudo $R^2 = .289$, suggesting that affective state accounted for 28.9% of the total variance in helping behavior.

Table 1.

Classification Table for Helping Behavior

<u>Condition</u>	<u>Helped</u>	<u>Did Not Help</u>	<u>Percentage</u>
Envy	30	8	78.95
Gratitude	41	0	100.00
Neutral	37	1	97.37

Hypothesis 2

First, I used a multiple regression analysis to assess whether there were any significant correlations between the three groups and the outcome measure. Because the predictor variable was categorical, I recoded the conditions using dummy coding to allow me to run the regression analysis. The overall model was significant, $F(2, 114) = 4.16, p = .02$. As expected, there was a significant negative association between the envy condition and the number of pencils picked up, $r^2 = -.26, p = .005$. A somewhat surprising finding was that there was no significant relationship between either gratitude ($p = .263$) and the neutral condition ($p = .110$) on the outcome measure.

I next used a One-Way Between Subjects ANCOVA to analyze how much help participants offered across the three conditions (measured via the number of pencils picked up, a continuous variable), while controlling for baseline levels of dispositional envy, trait gratitude,

prosocial tendencies, and self-esteem. This analysis was also tested at an alpha level of .05. The overall omnibus test was significant, $F(2, 109) = 3.31, p = .04, \eta^2 = .06$. None of the covariates was found to be significant, suggesting that there was no difference between groups on those four traits (See Table 3).

The assumptions that must be met to run a One-Way Between Subjects ANCOVA are that (1) the criterion variable is normally distributed, (2) there is homogeneity of the variance, and (3) all observations are independent from one another. Assumptions 1 and 3 were verified. However, Levene's test was significant, $F(2, 114) = 4.58, p = .01$, indicating that the assumption of homogeneity of variances was not met. A separate Welch's F-test was used to correct for this violation. The overall omnibus test was still significant, Welch's $F(2, 72.89) = 3.57, p = .03$. It should be noted that all 117 participants were included in this analysis, even those who did not help, in accordance with the reported analyses presented in Study 3 of Twenge et al. (2007), the paper from which this helping scenario was adapted.

Planned contrasts were used to assess differences in helping behavior between conditions (See Figure 1). Participants in the Envy condition ($M = 10.13, SD = 7.27$) helped significantly less than those in the Gratitude ($M = 13.54, SD = 5.22$) group, $t(66.73) = -2.38, p = .02$. Additionally, when compared to the Neutral ($M = 14.05, SD = 6.81$) group, those in the envy condition once again provided significantly less help $t(73.69) = -2.43, p = .02$. The Neutral and Gratitude conditions did not differ significantly from one another $t(69.25) = -.38, p = .71$.

Table 2.

Pretest Measures and Outcome Measure: Correlations and Descriptive Statistics

	1	2	3	4	5	6	7	8	9
1. Gratitude	–								
2. Benign Envy	.099	–							
3. Malicious Envy	-.424**	.036	–						
4. Prosocial Tendencies	.364**	.161	-.333**	–					
5. Self Esteem	.547**	.165	-.431**	.244**	–				
6. Pencils	.081	.039	-.046	.172	-.022	–			
7. Envy Condition	-.114	.018	.049	-.141	-.043	-.363**	–		
8. Gratitude Condition	.206	.052	-.014	-.016	-.033	.134	–	–	
9. Neutral Condition	-.098	-.072	-.035	.159	.009	.228*	–	–	–
Descriptive Statistics (N = 117)									
<i>M</i>	5.81	4.12	2.19	4.42	2.90	12.60			
<i>SD</i>	.78	.92	.84	.52	.57	6.64			

*. Correlation is significant at the 0.05 level (1-tailed).

** . Correlation is significant at the 0.01 level (1-tailed).

Table 3.

ANCOVA Results

Source	df	<i>F</i>	η^2	<i>p</i>
Benign Envy	1	.240	.002	.628
Malicious Envy	1	.018	.000	.894
Gratitude	1	.536	.005	.466
Prosocial Tendencies	1	1.044	.009	.309
Self-Esteem	1	1.046	.010	.309
Condition	2	3.313	.057	.040
Error	79			
Total	87			

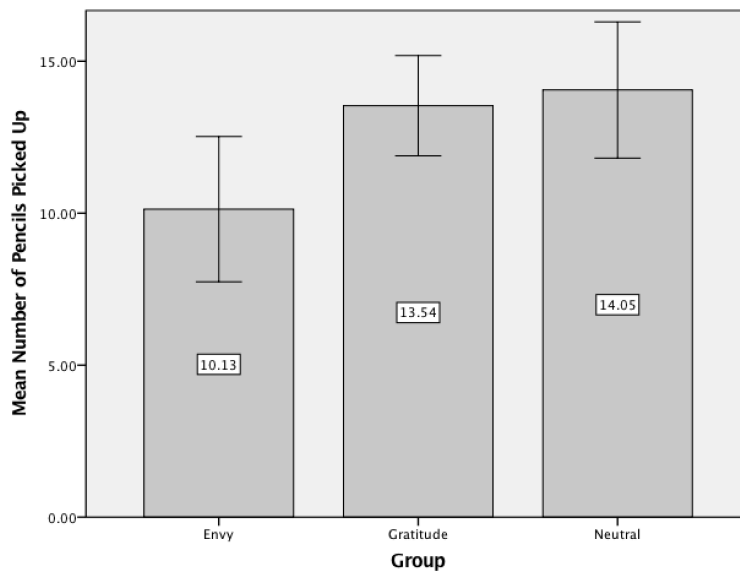


Figure 1. Differences between emotion conditions on the measure of helping behavior (number of pencils picked up). Participants in the Envy condition helped significantly less than those in both the Gratitude and Neutral groups. The latter two conditions did not differ significantly from one another.

Discussion

The results of this study provided partial support for the initial hypotheses. The hypotheses that those in an envious state would choose to help significantly less often and would provide less help overall than those in both the gratitude and neutral conditions were confirmed. However, there was not sufficient evidence to suggest that those in a grateful state helped more than those in the neutral control condition. One possible explanation regarding the lack of supporting evidence for hypothesis 2b is that participants in the neutral condition may have already been in a positive mood prior to the beginning of the study, and therefore did not differ enough in terms of affect from those in the gratitude group. This same difficulty with inducing a true neutral state has been found in previous research, suggesting that a neutral affective state is still somewhat positive (Diener & Diener, 1996; Storbeck & Clore, 2005).

Secondly, overall helping across conditions was fairly high in this study, so it is also worth noting that the outcome measure in this experiment was subject to a ceiling effect, as there was a definitive limit to the number of pencils a participant could actually pick up. Future studies would benefit from using a measure that takes this into account. A third possible reason for this discrepancy could be the neutral manipulation itself. As described in the results section, while participants who completed the neutral writing task did not rate their feelings of gratitude during the recall task as highly as those in the gratitude group, they still reported significantly higher levels than those in the envy condition. This was possibly due to the fact that the prime still maintained an element of human interaction, and participants may have unintentionally recalled the memory as being more positive rather than neutral.

Despite both being the result of an other-oriented focus, I found that envy and gratitude resulted in very different behavioral outcomes. Envy has also been found to correlate with a number of negative effects, such as feelings of depression and inferiority (Appel, Crusius, & Gerlach, 2015; van de Ven et al., 2015). This research provides evidence that feeling envious may not only affect the individual, but may also have a detrimental effect on one's interpersonal relationships. In our experimental scenario, envious individuals were less helpful, so it is important to consider how this might translate to real-world relationships between romantic partners, friends, and even colleagues. It is possible that this reduced likelihood of helping could potentially result in an individual being perceived as less agreeable or cooperative. Furthermore, envy may inhibit one's long-term ability to create a strong and supportive social network, thus perpetuating a cycle of negativity and isolation throughout one's life.

The findings indicate that being in an envious emotional state can significantly reduce helping behavior. However, in this study, choosing *not* to help can be considered a neutral or passive behavior. I plan to conduct a follow-up study that examines how envy will affect individual's choices when they are given the opportunity to actively "harm" a partner in a prisoner's dilemma style scenario. In this second study, I will address the limitations of Study 1 in the following ways: First, I will control for affect in addition to the other variables that were assessed here as covariates to ensure that baseline emotional state is controlled for statistically. Second, a more explicitly neutral prime will be used in the second study to allow me to better assess differences between individuals in the gratitude and control conditions.

Overview of Study 2

The intent of Experiment 2 was to replicate and extend the results of Experiment 1 by answering the question: Why would envy elicit less helping than gratitude? One somewhat mundane reason might be positive versus negative affect: people help others more in positive than negative moods. However, the link between affect and helping actually is rather complex and individuals have also been found to help more when in a negative affective state, particularly when they feel that helping will repair that negative state (Batson et al., 1989; Cialdini & Kenrick, 1976).

Another possible mediator for the hypothesized effect is that positive emotions engender a broader focus of attention, whereas negative emotions engender a narrower focus (Fredrickson 2001; Fredrickson & Branigan, 2005). Positive emotions also tend to elicit approach behaviors (Cacioppo, Gardner, & Berntson, 1999), causing individuals to focus more outside the self, and thus making them more likely to notice and offer help to others when it is needed. Given this relationship, it should be noted that the Positive and Negative Affect Schedule was included in this experiment to assess levels of affect in order to address one of the previously mentioned limitations of Study 1.

An additional purpose of Study 2 was to determine whether envy not only reduces helping, but also increases hurtful behavior. Study 1 found that envious people were less likely to help another, but does envy extend to increasing the likelihood of harming another? The scenario in Study 1 only offered participants the options to engage in an active helping behavior or remain neutral by simply choosing to remain passive and not provide any assistance to the confederate. In this second experiment, a Tangram puzzle task, also known as the Tangram Help Hurt Task

(THHT) was used to assess whether participants would choose to actively harm, help, or behave neutrally towards another individual when placed in a competitive scenario.

Tangram Task

Tangram tasks have been used successfully as a measure of helping and hurting behavior in a number of studies involving prejudice, aggression, and prosociality. In a series of three studies, Gentile et al. (2009) provided evidence to suggest that prosocial video games can increase prosocial behavior. In the third study, prosocial behavior was assessed experimentally using the tangram task. Participants were told that if their partner completed at least 10 of the 11 puzzles within 10 minutes, the partner would win a \$10 gift certificate. Participants who played a violent video game assigned significantly more difficult puzzles than their counterparts. Similarly, Saleem et al. (2012) extended these findings by examining the effects of prosocial video games on prosocial behavior in children. In this study, participants were told that another participant to whom they were assigning the tangrams was eligible to receive a \$10 gift certificate, but they were not. This was considered a measure of prosocial behavior because there was no tangible benefit to the participant, and only to the other participant with whom they would be assigning the puzzles. Ultimately, the researchers found that participants were more likely to assign difficult tangrams after playing violent video games.

These studies differ from my own Study 2 because the researchers were measuring prosocial behavior, and thus the participants were incentivized to *help* their partner. However, the relationship I was interested in examining is between envy and *harmful* behavior, so my instructions were altered to set up a competitive scenario rather than a prosocial one. Unlike the researchers, I used SONA credits rather than money as an incentive, but as in this study,

participants were led to believe that the incentive would be directly tied to their performance on the dependent variable—the puzzle task.

It is important to mention that one study did not yield significant results when using the Tangram Task as a measure of prosocial behavior (Tear & Nielsen, 2014). However, the authors believed that their sample ($N = 120$) produced questionable results due to the fact that it was comprised of nearly 88% males. They also mentioned that participants may have been more suspicious of the hypotheses than normal because the study had poor face validity. In addition to not producing significant findings on the tangram task, there was another measure in which participants were asked how much money they would like to donate to charity that also produced no significant differences between conditions. Given that there were null findings on both measures, this led me to believe that the lack of findings was, in fact, due to the issues with the participant sample and the overall cover story as the authors indicated, rather than an issue with using the Tangram Task as a measure of helping and hurting behavior.

In a more recent series of experimental and correlational studies, Saleem et al. (2016) provided evidence to suggest that the THHT is positively related to personality factors such as hostility, power, narcissism, and negatively related to empathy. These findings are especially relevant to my study given the relationship between these factors and envy. In Study 5 of the paper, the THHT was completed after participants read a controversial essay on abortion. The essay was intended to provoke the participants and put them in a negative state, which resulted in significant differences in regards to the number of difficult puzzles that were selected. Similarly, the memory-recall writing task I used in Study 2 was intended to induce participants into a negative, positive, or neutral state prior to completing the tangrams.

If the hypotheses detailed below are supported, this research will provide evidence to suggest that envy not only inhibits helping behavior, but also increases the likelihood of individuals seeking to harm others when given the opportunity.

Hypotheses

First, I hypothesized that there would be a significant effect of envy on the results of the Tangram task. More specifically, (1a) I predicted that participants in an envious state would be less helpful than their neutral counterparts, as indicated by the number of easy tangram puzzles they assigned to another student. I also predicted (1b) they would exhibit a higher rate of hurtful behavior, as indicated by the number of hard tangram puzzles they assigned. These were separate hypotheses because the Tangram task measures helping and hurting as two distinct outcomes.

Although there were no differences between the gratitude and neutral groups in Study 1, I predicted once again that there would be differences in this study due to the modified neutral condition. I expected the opposite outcomes for those in the gratitude condition relative to their neutral counterparts. More specifically, (2a) I predicted that participants in a grateful state would be more helpful than their neutral counterparts, as indicated by the number of easy tangram puzzles they assigned to another student. I also predicted (2b) they would exhibit less harmful behavior, as indicated by the number of hard puzzles assigned.

Finally, although this was not a focus of this study, in keeping with previous work, (3) I also expected that the number of Easy and Hard puzzles selected by each participant would be negatively correlated with one another.

Method

Power Analysis

A power analysis was conducted using G*Power software (Faul, Erdfelder, Buchner, & Land, 2009) to determine the sample size that would be needed for Study 2. Assuming a medium effect size, and using the smallest previously found correlation between gratitude and helping behavior ($r = .23$), it was found that 117 participants should be sufficient to detect an effect (power ≥ 0.8 , alpha ≤ 0.05).

Sample

Data was collected from 154 participants. Of these, 15 reported being suspicious of the hypotheses at the end of the experiment, 4 were removed because they failed the inattention checks that were built into the pre-test measure survey, and 8 were removed due to issues with administering the data and/or experimenter error. The final sample consisted of 127 ($M_{age} = 20.92$) English-speaking undergraduate students at Virginia Commonwealth University (VCU). Participants signed up through SONA, VCU's online research system. All participants received partial course credit for their participation.

The sample was largely female (27.3% male, 71.9% female, < 1% other). Once again, participants' self-reported racial identification offered a more diverse makeup: 41.3% White, 22.7% African-American/Black, 14.8% South Asian, 7% East Asian, 6.2% as more than one race, and 7.8% identified as Other/Unknown.

Research Design

This study was a one-way between-subjects factorial design because there were three levels of the independent variable. As in Study 1, the participants experienced an envy induction

($n = 43$), a gratitude induction ($n = 40$), or a neutral induction ($n = 44$) via the imagination memory-recall writing task. The outcome measures were how helpful and how harmful the participants chose to be during the Tangram Puzzle Task (recorded as continuous variables, operationalized as the difficulty level of the assigned puzzle task).

Procedure

Consent Process. All participants were told at the beginning of the session that the study involved three parts: a series of personality questionnaires, an imagination task, and a puzzle task that was intended to assess cognitive ability. Individuals who agreed to participate signed a consent form at this time.

Measures & Induction. All participants were asked to complete six self-report measures (see Appendices). As in Study 1, trait gratitude was measured using the Gratitude Questionnaire Six-Item Form (GQ-6, McCullough, Emmons, & Tsang, 2002) and trait envy was measured using the Benign and Malicious Envy Scale (BeMaS; Lange & Crusius, 2015). Participants once again also filled out the general prosocial attitudes measure (Osgood & Muraven, 2015) and a self-esteem scale (Rosenberg, 1965).

Additionally, participants filled out four new measures. The first of these was the Brief Self-Control Scale (Tangney, Baumeister, & Boone, 2004), which contained items such as “*I get distracted easily*” and “*I’m good at resisting temptation*”. All items were rated on a 1 (*Not at all like me*) to 5 (*Very much like me*) scale. This measure was included in order to control for varying levels of impulsivity and other traits related to decision-making, as these factors might

have played a role when participants were choosing which puzzles to assign.

The second new measure was the Agreeableness subscale of the Big Five Inventory (BFI; John & Srivastava, 1999). The Agreeableness subscale consists of nine self-report items that asks participants to answer items such as *“I am helpful and unselfish with others”* and *“I like to cooperate with others.”* All items were rated on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Agreeableness is defined as one’s propensity to get along well with others (or conversely, to be antagonistic towards others), and thus this trait might present a potential confound in the puzzle assignment task and needed to be statistically controlled.

The third additional measure was the Buss-Perry Aggression Scale (BPS; Buss & Perry, 1992). This scale consists of 29 self-report items that ask participants to answer items such as *“I have threatened people I know”* and *“I am an even-tempered person.”* All items were rated on a 7-point Likert-like scale, ranging from 1 (*extremely uncharacteristic of me*) to 7 (*extremely characteristic of me*). There are 4 subscales within this measure: Physical Aggression, Verbal Aggression, Anger, and Hostility. Only the hostility subscale is of interest here, given the previously described relationship between hostility and envy, and due to the fact that the nature of the dependent variable suggests that anger, physical aggression, and verbal aggression are not relevant factors in this context.

Finally, given the importance of affect in helping behavior, and to address a previously mentioned limitation of Study 1, it was important to control for baseline affect using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The measure consisted of 20 items that assess positive affect (active, alert, attentive, determined, enthusiastic, excited, inspired, interested, proud, and strong) and negative affect (afraid, ashamed, distressed, guilty, hostile, irritable, jittery, nervous, scared, upset ($\alpha = .86$ for the Positive Affect Scales and

$\alpha = .87$ for the Negative Affect Scales). Participants were asked to describe their current emotions by rating items on a 5-point Likert scale from 1 (*not at all*) to 5 (*extremely*).

After completing the pre-induction scales, participants were randomly assigned to one of three groups (envy, gratitude, or neutral) and completed the emotion-recall writing task as in Study 1. The envy and gratitude primes remained the same. However, the neutral prime was modified, due to the possibility that participants defaulted to remembering a positive interaction with a salesperson as detailed in the discussion of Study 1. Participants in the neutral condition heard the following instructions: *“Please take one minute to look at the room around you, taking note of as many details as possible.”* Participants were given one minute to look around, and were then provided with the following instructions: *“Please spend the next ten minutes writing about the room around you, providing as many details about it as possible. The experimenter will let you know when ten minutes has passed.”*

Post-Induction Manipulation Check (Current Affect). After ten minutes, the experimenter told the participant the writing task was over, and had them fill out the first manipulation check form, providing the following instructions: *“Please respond to the following statements about the scenario you wrote about earlier.”* Participants then responded to same 6 manipulation check items as in Study 1, except that they will be worded to measure participants’ current emotions. The questions will be as follows: 1) *“How bitter/resentful do you currently feel regarding the scenario you wrote about?”* 2) *“How envious does thinking about the scenario make you feel now?”*, 3) *“How negatively do you feel when thinking now about the scenario?”* 4) *“How grateful does thinking about the scenario make you feel now?”* 5) *“How appreciative do you currently feel regarding the scenario you wrote about?”* and 6) *“How positively do you feel*

when thinking about the scenario now?” All of these questions were rated on a scale of 1 (Not at all) to 5 (Extremely). It should be noted that this assessment needed to take place immediately after the induction to assess whether participants’ affect was truly affected by the writing manipulation.

Tangram Task. Participants next completed the Tangram Help/Hurt Task (adapted from Saleem, Anderson, & Barlett, 2015). The experimenter introduced participants to the tangram puzzle task via an online video, which explained the instructions and showed them 3 brief example puzzles, each of a varying difficulty. Having participants view the video was intended to help them get a clearer idea of how the puzzles worked and also allow them to see how the difficulty of each puzzle varies as the number of pieces increases (easy, medium, difficult).

The experimenter then told participants, *“Another participant has selected a set of 11 puzzles for you to complete, and you will now select some for them. If both you and the other participant are able to complete the puzzle sets in less than ten minutes, you will each receive an additional .25 credits for the study. However, if one or both of you are unable to complete the puzzles in the required amount of time, the winner will be whoever completes the puzzles first. As the sole winner, this person will receive an additional .5 credits for participating in the study.”*

Previous research has also used compete-or-cooperate scenarios and outcome possibilities as a means of incentivizing participants (Saleem et al., 2012; 2015). Participants did not actually complete any puzzles at this time, and received the full 1.50 credits regardless of their performance in this portion of the study.

Participants were then told that they needed to select puzzles for the other participant to complete. Once they made their selections, the experimenter asked them to complete a few brief

forms before it was their turn to complete the puzzles. At this time, the participants completed the Motivations for Tangram Assignment Questionnaire (Saleem, Anderson, & Barlett, 2015). The outcome being measured was the difficulty of the tangrams that the participants assigned to the other participant, such that easier tangrams were associated with helping behavior, while more difficult tangrams were associated with hurtful behavior.

Final Manipulation Check (Post Dependent Variable). After participants completed the Motivation for Tangram Assignment measure, they completed the same manipulation check measures as in Study 1. Once again, these questions were intended to assess whether participants followed directions in the writing task by describing a scenario that met the criteria for envy, gratitude, or a neutral response. Finally, they completed the same demographic information as in Study 1, including age, sex, and race. Participants also answered one new question: *“It was very important for me to receive the additional SONA credit during the puzzle task.”* This question was assessed using a Likert scale of 1 (*Totally Disagree*) to 7 (*Totally Agree*). Upon completing these measures, the experiment was over and the participants were debriefed.

Results

Random Assignment

A chi-square analysis was used to assess whether random assignment was successful in ensuring that participant differences in race and gender were equal across groups. There was no significant difference between the groups with regards to race $\chi^2(14) = 12.31, p = 0.58$. The chi-square analysis was especially crucial with gender, as there was such a discrepancy between the number of males and females that participated in the study. Overall, the gender breakdown of the

groups was as follows: the envy group included 10 males and 33 females, the gratitude group included 12 males and 28 females, and the neutral group included 13 males and 30 females. There was no significant difference between the groups with regards to gender, $\chi^2(2) = .666, p = 0.72$, indicating that random assignment was successful in distributing differences equally across groups.

Manipulation Check 1 (Post Induction)

The manipulation check was assessed using the same method as in Study 1. First, the subjective ratings that had been provided by each participant were examined for reported affective differences between conditions. I calculated the mean of first three items of the manipulation check (envy manipulation check subscale) and the last three items (gratitude manipulation check subscale). Then, I used a one-way MANOVA to assess if there were differences between the subjective ratings across conditions. Results suggested that participants differed significantly on both the envy $F(2, 124) = 30.51, p < .001, \eta^2 = .330$ and gratitude $F(2, 124) = 54.02, p < .001, \eta^2 = .466$ subscales across the three conditions.

A Tukey post-hoc analysis was conducted to determine the direction of the differences. Participants in the envy condition ($M = 2.40, p < .001$) reported significantly higher envy scores relative to both their grateful ($M = 1.18, p < .001$) and neutral counterparts ($M = 1.23, p < .001$). The latter two groups did not differ significantly from one another on the envy subscale. On the gratitude subscale, I found that those in the gratitude condition reported the highest scores on this measure ($M = 4.67, p's < .001$) relative to both their envious and neutral counterparts. Participants in the envy and neutral condition did not report significant differences from one another on this subscale. This final non-significant finding provides evidence to suggest that all

primes elicited the correct affective responses, and that the attempt to make the control group prime more explicitly neutral in this study was successful.

Narrative Coding

As in Study 1, two independent raters who were blind to condition coded each of the narratives written by the participants, using an adapted version of the same scale that participants had completed. All of the same items from the original scale were included, but were written such that they asked the raters to assess how much the participant seemed to exhibit each feeling in the narrative. The items were again rated on a 1 to 5 scale.

Once again, a very high degree of reliability was found between raters on each of the manipulation check measurements. For the envy manipulation, the Interclass Correlation Coefficient (2, 2) = .925, 95% CI = .894 to .947 $F(126, 126) = 13.39, p < .001$. For the gratitude manipulation, the ICC (2,2) = .953, 95% CI = .934 to .967, $F(126, 126) = 21.40, p < .001$. From these analyses, we can conclude that the manipulation was successful.

Manipulation Check 2 (Post Dependent Variable)

An additional manipulation check was added to assess whether the event participants had written about was still salient following the puzzle measure. As with the previous manipulation check, I used a one-way MANOVA to assess whether there were differences among groups. The means were calculated in the same manner as with the previous manipulation check. Participants differed significantly on both the envy $F(2, 124) = 57.06, p < .001, \eta^2 = .479$ and gratitude $F(2, 124) = 38.41, p < .001, \eta^2 = .383$ subscales across the three conditions.

A Tukey post-hoc analysis was conducted to determine the direction of the differences. As with the previous manipulation check, participants in the envy condition ($M = 3.25, p < .001$) reported significantly higher envy scores relative to both their grateful ($M = 1.44, p < .001$) and neutral counterparts ($M = 1.15, p < .001$). The latter two groups did not differ significantly from one another on the envy subscale. On the gratitude subscale, I found that those in the gratitude condition reported significantly higher scores on this measure ($M = 4.17, p's < .001$) relative to the other two groups. Lastly, participants in the envy condition ($M = 2.00, p = .08$) did not report significantly different feelings of gratitude relative to the neutral group.

Once again, these findings suggest that all primes elicited the appropriate emotional responses, and that I succeeded in making the control prime more explicitly neutral in this study. Moreover, with the addition of the second manipulation check, I was also able to determine that the effects of the induction lasted throughout the duration of the experiment.

Hypothesis 1 and 2

I used a One-Way Between Subjects MANCOVA to analyze how much participants differed in their helping and harming scores across the three conditions. The five dependent variables were as follows: the number of puzzles selected per difficulty (Easy, Medium, and Hard), self-reported intent to help, and self-reported intent to harm). The covariates controlled for in this model were the participants' baseline levels of dispositional envy, trait gratitude, prosocial tendencies, self-esteem, behavioral self-control, agreeableness, hostility, and affect. Thus, this was a rather stringent test of the hypothesis.

The assumptions that must be met to run a One-Way Between Subjects MANCOVA are that (1) the observations are random and independent of one another, (2) the independent

variables are categorical and the dependent variables are continuous, (3) there is an absence of multicollinearity, (4) multivariate normality is present in the data, (5) there is homogeneity of the variance and covariance. Assumptions 1, 2, 3, and 4 were verified prior to running the analyses. This analysis was also tested at an alpha level of .05.

In regards to assumption 5, Levene's Test was used to assess homogeneity of the variance, and Box's M Test was used to assess homogeneity of the covariance. Levene's test was non-significant for all five of the dependent variables, indicating that the assumption of homogeneity of variance had been met. However, Box's M test was significant, *Box's M* = 140.311, $F(90, 41596.625) = 1.398, p = .008$, indicating that the assumption of homogeneity of the covariances had been violated. Due to this violation, Pillai's trace was used as a correction. This test is robust and powerful, and is also helpful when sample sizes are uneven across groups, as is the case with the current data. According to the test statistic, there was a significant difference across groups when all covariates were accounted for, *Pillai's trace* = .148, $F(8, 224) = 2.234, p = .026, \eta^2 = .074$. Although this was a small effect size of 7.4%, the test achieved a power of $\beta = .862$.

Table 4.

Outcome Measures: Estimated Group Means and Descriptive Statistics

Dependent Variable	Group	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Easy Puzzles	Envy	2.764	.407	1.958	3.569
	Gratitude	3.590	.415	2.769	4.411
	Neutral	3.467	.391	2.692	4.243
Medium Puzzles	Envy	3.906	.257	3.396	4.417
	Gratitude	4.058	.263	3.537	4.579
	Neutral	4.425	.248	3.934	4.917
Hard Puzzles	Envy	4.330	.346	3.645	5.015
	Gratitude	3.352	.352	2.654	4.050
	Neutral	3.107	.333	2.448	3.767
Intent to Help	Envy	2.622	.194	2.237	3.006
	Gratitude	2.587	.198	2.195	2.979
	Neutral	2.950	.187	2.580	3.320
Intent to Harm	Envy	2.687	.178	2.335	3.040
	Gratitude	2.502	.181	2.142	2.861
	Neutral	2.024	.171	1.685	2.363

a: All statistics were calculated with the following covariates held constant: Trait Gratitude, Benign Envy, Malicious Envy, Prosocial Tendencies, Self-Esteem, Positive Affect, Negative Affect, Behavioral Self-Control, Hostility, Agreeableness.

The univariate F tests results were as follows (See Table 5): There was no significant difference between groups in regards to the number of Easy puzzles that were assigned $F(2, 114) = 1.128$ $p = .33$, $\eta^2 = .02$, meaning that there was not enough evidence to support hypothesis 1a or 2a (See Figure 2). In addition, they did not differ in the amount of Medium puzzles assigned

$F(2, 114) = 1.097, p = .34, \eta^2 = .02$ nor in their self-reported Intent to Help scores $F(2, 114) = 1.103, p = .34, \eta^2 = .02$. However, Hypothesis 1b was supported, as the groups did differ on both the Hard puzzle measure $F(2, 114) = 3.386, p = .037, \eta^2 = .06$ and their self-reported Intent to Harm $F(2, 114) = 3.787, p = .026, \eta^2 = .06$.

Table 5.

Outcome Measures: Univariate Tests^a

Dependent Variable	df	<i>F</i>	η^2	<i>p</i>
Easy	2	1.128	.019	.327
	114			
Medium	2	1.097	.019	.338
	114			
Hard	2	3.386	.058	.037
	114			
Intent to Help	2	1.103	.019	.335
	114			
Intent to Harm	2	3.787	.062	.026
	114			

a: All *F*-values include the following covariates: Trait Gratitude, Benign Envy, Malicious Envy, Prosocial Tendencies, Self-Esteem, Positive Affect, Negative Affect, Behavioral Self-Control, Hostility, Agreeableness.

Follow-up pairwise comparisons were conducted to determine the direction of significance among the groups on the Hard puzzle and Intent to Harm measures. The means used in these comparisons are listed above (See Table 4). It should be noted that these are the adjusted means after all covariates had been included in the model. Participants in the Envy condition ($M = 4.33, SD = .35, p = .014$) assigned significantly more hard puzzles relative to their neutral

counterparts ($M = 3.11$, $SD = .33$, $p = .014$), providing evidence to support hypothesis 1b (See Figure 3). The difference between the Envy and Gratitude groups ($M = 3.35$, $SD = .35$, $p = .06$) was not statistically significant. The Neutral and Gratitude groups also did not differ significantly on this measure, and thus there was not enough evidence to support hypothesis 2b.

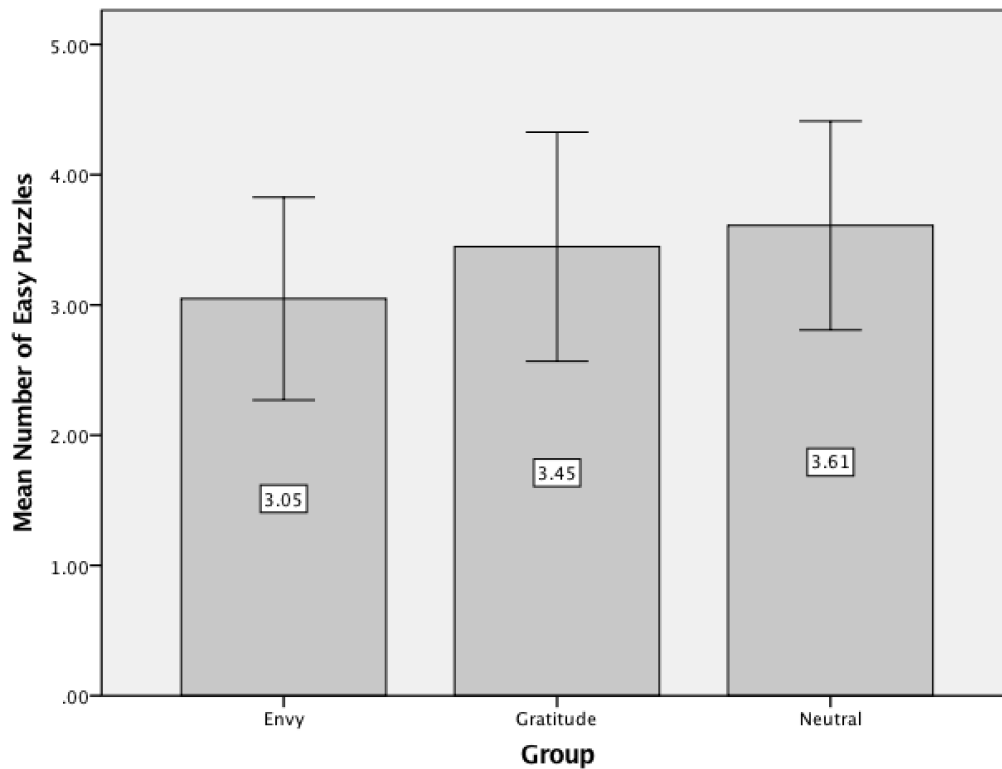


Figure 2. Differences between emotion conditions on the measure of help scores (number of easy puzzles assigned). There were no significant differences between groups on this measure.

Note: Means pictured above were calculated prior to adjustment for covariates.

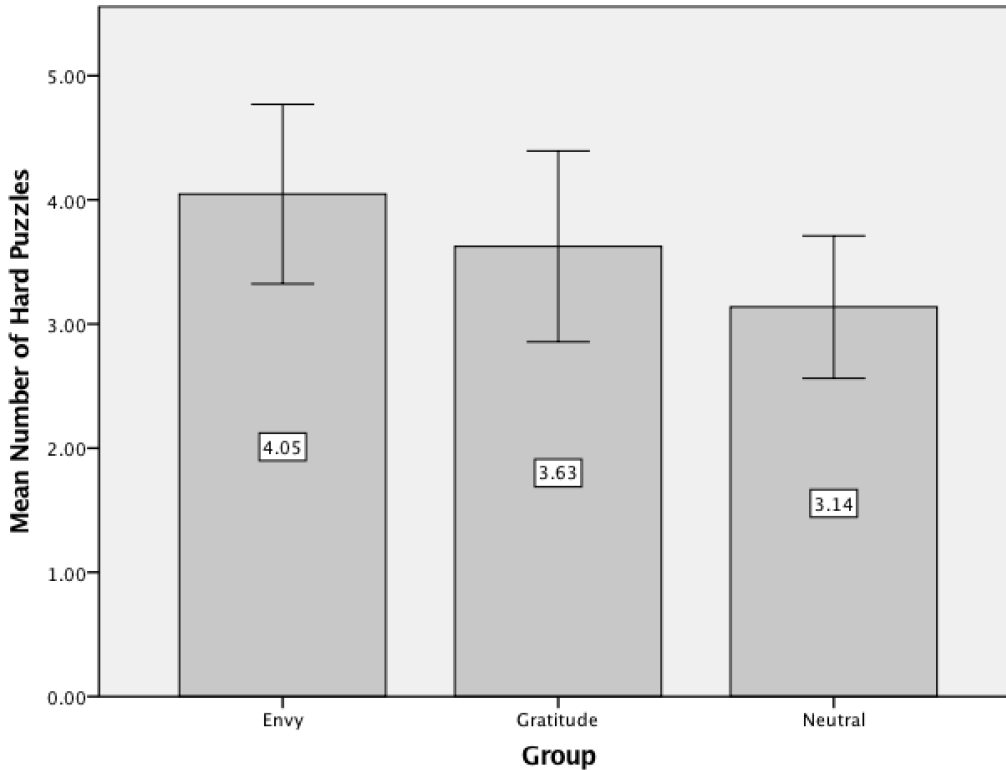


Figure 3. Differences between emotion conditions on the measure of harm scores (number of difficult puzzles assigned). Participants in the Envy condition assigned significantly more difficult puzzles relative to the Neutral condition. Note: Means pictured above were calculated prior to adjustment for covariates.

Although this was not part of the initial hypotheses, it was interesting to note that participants' self-reported intent to harm followed a pattern that was similar to the actual behavior they had exhibited in the puzzle task (See Figure 4). Participants in the Envy group reported a significantly higher intent to harm the other participant ($M = 2.69$, $SD = .178$, $p = .010$) than those in the Neutral group ($M = 2.024$, $SD = .181$, $p = .010$). Once again, there was no significant difference between the Envy and Gratitude groups ($p = .48$) or between the Gratitude and Neutral groups ($p = .06$).

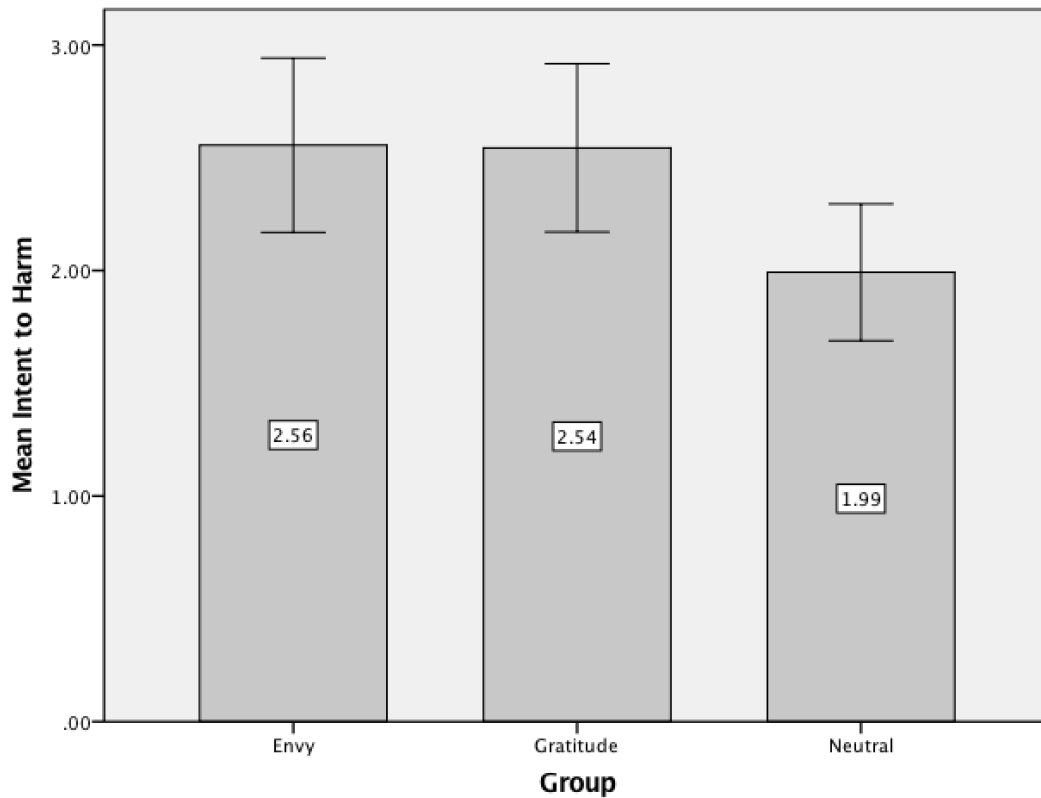


Figure 4. Differences between emotion conditions on the measure of self-reported intent to harm. Participants in the Envy condition reported significantly greater intent to harm relative to those in the Neutral condition. There was not a significant difference in intent to harm between the Envy and Gratitude groups nor the Gratitude and Neutral groups. Note: Means pictured above were calculated prior to adjustment for covariates.

Hypothesis 3

I used a bivariate Pearson's product moment correlation to assess the first hypothesis that the number of helping and harming tangrams assigned by each participant would be negatively correlated (See Table 6). The assumptions that must be met to use this analysis are: (1) The level of measurement for each variable is continuous, (2) the pairs are related, (3) there is an absence

of outliers, (4) the variables are normally distributed, (5) a linear relationship exists between the variables, and (6) homoscedasticity. All assumptions were verified prior to running the analysis, and an alpha level of .05 was used.

The hypothesis was supported, with results indicating that the number of easy puzzles selected negatively predicted the number of hard puzzles that would be selected ($r = -.79, p < .001$). Interestingly, the number of easy puzzles was also negatively correlated with those of medium difficulty ($r = -.50, p < .001$). For comparison, there was not a significant correlation between the number of medium and hard puzzles that were selected.

Table 6.

Pretest Measures and Outcome Measures: Correlations and Descriptive Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gratitude	—													
2. Benign Envy	-.08	—												
3. Malicious Envy	-.48**	.34**	—											
4. Prosocial Tendencies	.47**	-.05	-.25**	—										
5. Self Esteem	.45**	.03	-.43**	.12	—									
6. Positive Affect	.30**	.12	-.26**	.17	.22**	—								
7. Negative Affect	-.27**	.14	.19**	-.07	-.34**	-.02	—							
8. Behavior Self Control	.33**	.08	-.29**	.10	.38**	.03	-.20*	—						
9. Hostility	-.51**	.30**	.49**	-.28**	-.47**	-.15	.24**	-.34**	—					
10. Agreeableness	.59**	-.04	-.38**	.43**	.30**	.28**	-.32**	.27**	-.54**	—				
11. Easy Puzzles	-.04	-.04	.02	.09	-.06	-.18*	.09	.08	-.08	.05	—			
12. Hard Puzzles	-.01	.05	-.04	.01	.08	.22*	-.05	-.08	.09	-.06	-.80**	—		

Table 6, *continued*

13. Intent to Help	.03	-.14	-.11	.17	-.08	-.04	.05	.03	-.15	.08	.72**	-.68**	—	
14. Intent to Harm	-.06	.17	.06	-.15	.01	.16	-.01	-.08	.18*	-.09	-.66**	.77**	-.69**	
Variables (N = 127)														
<i>M</i>	5.94	4.00	2.12	4.49	2.89	29.79	15.54	3.24	3.19	3.86	3.27	3.60	2.72	2.40
<i>SD</i>	.81	.93	.87	.49	.52	7.67	5.57	.59	1.27	.58	2.55	2.23	1.22	1.16

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

Discussion

The results of this study provided partial support for the initial hypotheses, and extended the findings from Study 1. The hypothesis that those in an envious state would choose to hurt another when given the opportunity was confirmed, which informs us that envy might serve as a catalyst for harmful behaviors towards others. This makes sense when considering the previously discussed relationships between envy and other personality factors like schadenfreude and hostility. While the prediction regarding envy and harmful behavior was supported, there was not sufficient evidence to support the other hypotheses, as envious participants did not help less, nor did those in a grateful state help more (or harm less) than those in the neutral control condition.

One possible explanation regarding the lack of supporting evidence for hypotheses involving helping behavior is that since participants were placed in a competitive scenario, they would be less likely to actively choose to help regardless of their affective state. This is somewhat similar to Study 1, in which envious participants opted to remain passively neutral rather than offer help. However, in this more competitive context, it was the other two groups that opted for passive neutrality rather than take the opportunity to actively harm another individual.

A second possible reason for this finding was that being in either an envious or a grateful mood—essentially anything other than an affectively neutral state—motivated participants to strive to win the puzzle game in order to repair their negative mood, or in order to extend an already positive mood. This is seemingly contradictory based on previous work around helping behavior that says we help to improve a negative mood or to extend a positive mood. However, the findings were corroborated by converging results on both the self-reported intent to harm measures and participants' actual behavior in the puzzle selection task.

A third possible reason for this discrepancy could be due to the sample size. Although the overall power of the sample was sufficient, the addition of covariates into the originally proposed model and uneven group sizes resulted in the power of the sample being slightly lower than initially expected. However, the mean difference between the gratitude and envy groups was near significance in the hypothesized direction on the hard puzzle measure, and an effect may have been correctly detected if more data had been collected.

In summary, I found that envy and gratitude resulted in very different behavioral outcomes dependent upon the context of the scenario. I also found support for the theory that there may indeed be two types of envy, an idea that has been recently debated in the literature (Cohen-Charash & Larson, 2017). The correlational findings indicated that malicious envy and gratitude were significantly related to all of the model covariates in opposing ways. This signifies that these two constructs share unique relationships with factors that can be considered central to the experience of envy, such as self-esteem, hostility, affect, and agreeableness. Moreover, benign envy did not share any of these same relationships, indicating that it is, in fact, an emotional experience that is distinct from malicious envy.

The findings from this study are especially important because they highlight the toxic effects of the emotional experience of envy, not only for the individual, but also in a social context. In a neutral context, envious individuals are less likely to offer help to a stranger. However, in a more competitive scenario, envious individuals are more likely to choose to actively harm another. Thinking back to the office co-worker example presented in the introduction of this thesis, this suggests that Employee 2 may go so far as to sabotage Employee 1's work performance if he feels his future employment is at stake as a result of not receiving the promotion. Future research should examine whether envious individuals are more likely to harm

others when resources are scarce, as this may have important real-world implications in the context of scapegoat theory (Glick, 2002), especially when considering modern social and political attitudes towards immigrants and the economy. There is the possibility that individuals who perceive a scarcity of resources (such as jobs and money), may exhibit increased prejudice and be more likely to engage in harmful behavior towards outgroup members as a result of experiencing envy.

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Appendix A: Scale Measures

The Gratitude Questionnaire-Six Item Form (GQ-6; McCullough, Emmons, Tsang, 2002)

Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it.

- 1 = strongly disagree
- 2 = disagree
- 3 = slightly disagree
- 4 = neutral
- 5 = slightly agree
- 6 = agree
- 7 = strongly agree

- ___ 1. I have so much in life to be thankful for.
- ___ 2. If I had to list everything that I felt grateful for, it would be a very long list.
- ___ 3. When I look at the world, I don't see much to be grateful for.
- ___ 4. I am grateful to a wide variety of people.
- ___ 5. As I get older I find myself more able to appreciate the people, events, and situations that
have been part of my life history.
- ___ 6. Long amounts of time can go by before I feel grateful to something or someone.

Appendix B: Benign and Malicious Envy Scale (BeMaS; Lange & Crusius, 2015)

Instructions: *Below, you will find statements related to situations when you lack another's superior quality, achievement, or possession and you either desire it or wish that the other lacks it. Please indicate for every statement how much you agree or disagree with it. There are no right or wrong answers. Don't hesitate to indicate the first answer that comes to your mind.*

benign1	<i>When I envy others, I focus on how I can become equally successful in the future.</i>
malicious1	<i>I wish that superior people lose their advantage.</i>
benign2	<i>If I notice that another person is better than me, I try to improve myself.</i>
benign3	<i>Envyng others motivates me to accomplish my goals.</i>
malicious2	<i>If other people have something that I want for myself, I wish to take it away from them.</i>
malicious3	<i>I feel ill will towards people I envy.</i>
benign4	<i>I strive to reach other people's superior achievements.</i>
malicious4	<i>Envious feelings cause me to dislike the other person.</i>
benign5	<i>If someone has superior qualities, achievements, or possessions, I try to attain them for myself.</i>
malicious5	<i>Seeing other people's achievements makes me resent them.</i>

Participants answer on a 6-point scale (1 = *strongly disagree*, 6 = *strongly agree*).

Appendix C: General Prosocial Tendencies Questionnaire (adapted from Osgood & Muraven 2015)

Please rate how much you agree with each of the following statements using the following scale:

1 = Strongly Disagree to 5 = Strongly Agree

- 1) It is important to help someone who needs it. _____
- 2) I want to help others. _____
- 3) The well-being of others is important. _____
- 4) It is important that others are happy. _____
- 5) It is important that all people are happy. _____
- 6) The needs of others are important. _____

Appendix D: Rosenberg Self-Esteem Scale (Rosenberg, 1965)

Instructions: Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

1 = Strongly Agree to 4 = Strongly Disagree

1. On the whole, I am satisfied with myself.
2. At times I think I am no good at all.
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I certainly feel useless at times.
7. I feel that I'm a person of worth, at least on an equal plane with others.
8. I wish I could have more respect for myself.
9. All in all, I am inclined to feel that I am a failure.
10. I take a positive attitude toward myself.

Scoring: Items 2, 5, 6, 8, 9 are reverse scored. Give “Strongly Disagree” 1 point, “Disagree” 2 points, “Agree” 3 points, and “Strongly Agree” 4 points. Sum scores for all ten items. Keep scores on a continuous scale.

Appendix E: The Brief Self-Control Scale (Tangney, Baumeister, & Boone, 2004)

Directions: Using the 5-point scale below as a guide, write a number beside each statement to indicate how much you agree with it.

1 = very much unlike me

2 = unlike me

3 = neutral

4 = like me

5 = very much like me

___ 1. I am good at resisting temptation.

___ 2. I have a hard time breaking bad habits.

___ 3. I am lazy.

___ 4. I say inappropriate things.

___ 5. I do certain things that are bad for me, if they are fun.

___ 6. I refuse things that are bad for me.

___ 7. I wish I had more self-discipline.

___ 8. People would say that I have iron self-discipline.

___ 9. Pleasure and fun sometimes keep me from getting work done.

___ 10. I have trouble concentrating.

___ 11. I am able to work effectively toward long-term goals.

___ 12. Sometimes I can't stop myself from doing something, even if I know it's wrong.

___ 13. I often act without thinking through all the alternatives.

Appendix F: Positive and Negative Affect Schedule (PANAS-SF; Watson, Tellegen, & Clark, 1988)

Instructions: Indicate the extent you currently feel this way.

		Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
PANAS 1	Interested	1	2	3	4	5
PANAS2	Distressed	1	2	3	4	5
PANAS3	Excited	1	2	3	4	5
PANAS4	Upset	1	2	3	4	5
PANAS5	Strong	1	2	3	4	5
PANAS6	Guilty	1	2	3	4	5
PANAS7	Scared	1	2	3	4	5
PANAS8	Hostile	1	2	3	4	5
PANAS9	Enthusiastic	1	2	3	4	5
PANAS10	Proud	1	2	3	4	5
PANAS11	Irritable	1	2	3	4	5
PANAS12	Alert	1	2	3	4	5
PANAS13	Ashamed	1	2	3	4	5
PANAS14	Inspired	1	2	3	4	5
PANAS15	Nervous	1	2	3	4	5
PANAS16	Determined	1	2	3	4	5
PANAS17	Attentive	1	2	3	4	5
PANAS18	Jittery	1	2	3	4	5
PANAS19	Active	1	2	3	4	5
PANAS20	Afraid	1	2	3	4	5

Appendix G: Big Five Inventory – Agreeableness (John & Srivastava, 1999)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Disagree	Disagree	Neither agree	Agree	Agree
Strongly	A little	Nor disagree	A little	Strongly
1	2	3	4	5

- 1) I tend to find fault with others.
- 2) I am helpful and unselfish with others.
- 3) I start quarrels with others.
- 4) I have a forgiving nature.
- 5) I am generally trusting of others.
- 6) I can be cold and aloof.
- 7) I am considerate and kind to almost everyone.
- 8) I am sometimes rude to others.
- 9) I like to cooperate with others.

Appendix H: Aggression Scale (Buss & Perry, 1992)

Please rate each of the following items in terms of how characteristic they are of you. Use the following scale for answering these items.

1 (*extremely uncharacteristic of me*) to 7 (*extremely characteristic of me*)

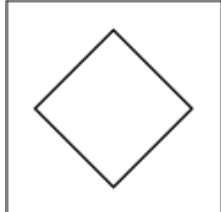
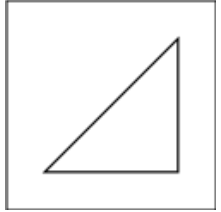

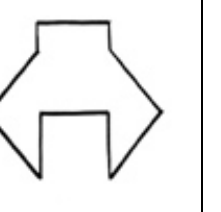
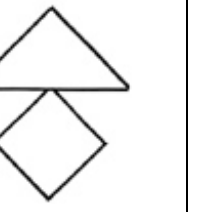
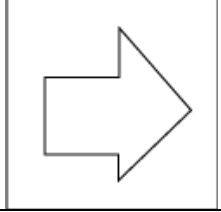
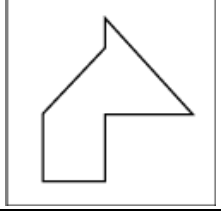
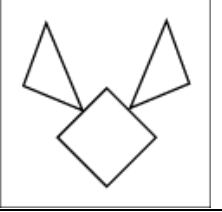
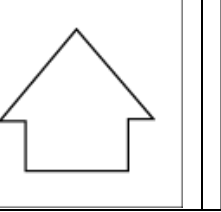
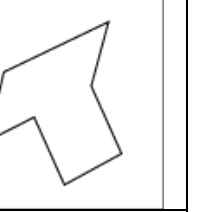
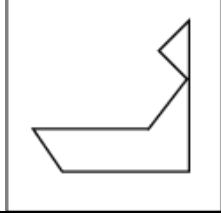
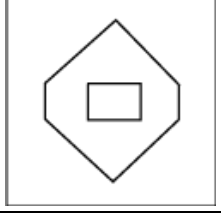
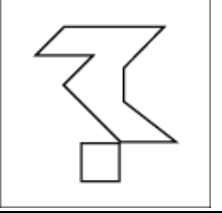
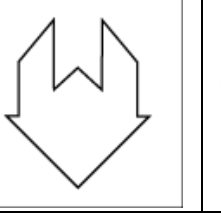
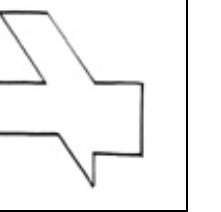
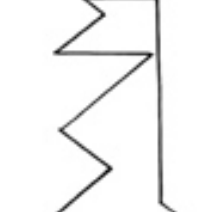


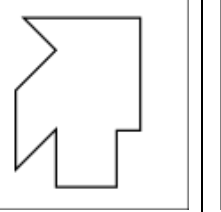
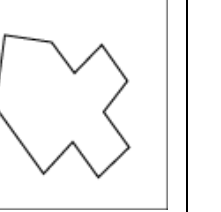
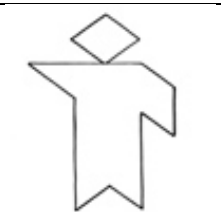

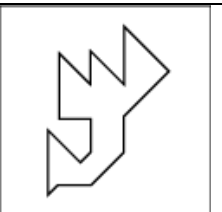
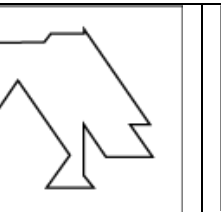
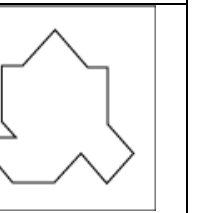

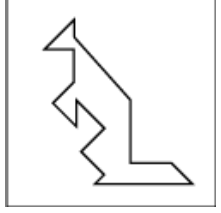
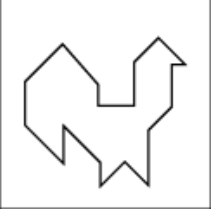
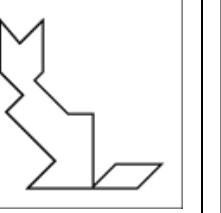
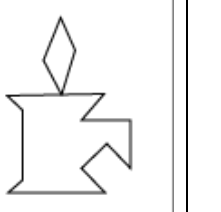
- 1) Once in a while I can't control the urge to strike another person.
- 2) Given enough provocation, I may hit another person.
- 3) If somebody hits me, I hit back.
- 4) I get into fights a little more than the average person.
- 5) If I have to resort to violence to protect my rights, I will.
- 6) There are people who pushed me so far that we came to blows.
- 7) I can think of no good reason for ever hitting a person.
- 8) I have threatened people I know.
- 9) I have become so mad that I have broken things.
- 10) I tell my friends openly when I disagree with them.
- 11) I often find myself disagreeing with people.
- 12) When people annoy me, I may tell them what I think of them.
- 13) I can't help getting into arguments when people disagree with me.
- 14) My friends say that I'm somewhat argumentative.
- 15) I flare up quickly but get over it quickly.
- 16) When frustrated, I let my irritation show.
- 17) I sometimes feel like a powder keg ready to explode.

- 18) I am an even-tempered person.
- 19) Some of my friends think I'm a hothead.
- 20) Sometimes I fly off the handle for no good reason.
- 21) I have trouble controlling my temper.
- 22) I am sometimes eaten up with jealousy.
- 23) At times I feel I have gotten a raw deal out of life.
- 24) Other people always seem to get the breaks.
- 25) I wonder why sometimes I feel so bitter about things.
- 26) I know that "friends" talk about me behind my back.
- 27) I am suspicious of overly friendly strangers.
- 28) I sometimes feel that people are laughing at me behind me back.
- 29) When people are especially nice, I wonder what they want.

Appendix I: Tangram Materials (Saleem, Anderson, & Barlett, 2015)

Tangram Puzzle Task Selection Sheet

Instructions: As we explained earlier, you are now going to assign 11 tangram puzzles for the other participant to solve in 10 minutes. If both you and the other participant are able to complete the puzzle sets in less than ten minutes, **you will each receive an additional .25 credits for the study.** However, if one or both of you are unable to complete the puzzles in the required amount of time, the winner will be whoever completes the puzzles first. **As the sole winner, this person will receive an additional .5 credits for participating in the study.** However, please remember that the other participant will not see you or know who you are, so feel free to assign them any tangrams you like. On the next page, please circle the 11 tangrams you wish to assign the other participant. Please let the experimenter know once you are done.

Easy				
				
				
Medium				
				
				
Hard				
				
				

Appendix J: Motivation Questions for Tangram Assignment (Saleem, Anderson, & Barlett, 2015)

Instructions: Please rate the extent to which each of the following reasons influenced your decisions on which tangrams to choose for the other person to solve, using the following rating scale:

1	2	3	4	5
not at all	a little bit	Somewhat	quite a lot	a lot

- 1) I wanted to provide a range of tangram puzzles.
- 2) I wanted to help the other participant win the additional credits.
- 3) I wanted to make it difficult for the other participants to win the additional credits.
- 4) I wanted to hurt the other participants' chances of earning the additional credits.
- 5) I wanted to give the other participant harder puzzles to complete.

Appendix K: Manipulation Check Questionnaire (Current)

ID#/Group_____

MEMORY RECALL QUESTIONNAIRE 1

Thinking back to the scenario you just wrote about, please answer each of the following statements using the following scale:

1 = Not at All to 5 = Extremely

- 1) How bitter/resentful do you currently feel thinking about it? _____
- 2) How envious do you currently feel thinking about it? _____
- 3) How negatively do you currently feel thinking about it? _____
- 4) How grateful do you currently feel thinking about it? _____
- 5) How appreciative do you currently feel thinking about it? _____
- 6) How positively do you currently feel thinking about it? _____

Appendix L: Manipulation Check Questionnaire (Post Dependent Variable)

ID#/Group_____

MEMORY RECALL QUESTIONNAIRE

Thinking back to the scenario you wrote about earlier, please answer each of the following statements using the following scale:

1 = Not at All to 5 = Extremely

- 1) At the time the scenario occurred, how bitter/resentful did you feel? _____
- 2) At the time the scenario occurred, how envious did you feel? _____
- 3) At the time the scenario occurred, how negatively did you feel? _____
- 4) At the time the scenario occurred, how grateful did you feel? _____
- 5) At the time the scenario occurred, how appreciative did you feel? _____
- 6) At the time the scenario occurred, how positively did you feel? _____

Appendix M: General Information – Demographics (Study 1)

Age: _____ Sex (circle one): Male Female Other

Ethnicity (check one):

_____ White/Caucasian _____ Asian
_____ Hispanic/Latino(a) _____ Native American
_____ African-American/Black _____ Other – Please list: _____

Is English your native language? _____ Yes _____ No

If no, please list your native language: _____

What country were you born in? _____

In your own words, what do you think the current study was about? Did anything seem strange or out of the ordinary when you were participating?

Appendix N: General Information – Demographics (Study 2)

1) What is your gender?

Male Female Male to Female Female to Male Does not identify

2) What is your age? _____

3) What is your ethnicity?

Hispanic or Latino Not Hispanic or Latino Unknown

4) What is your race?

American Indian/Alaska Native
 East Asian
 South Asian
 Native Hawaiian/Pacific Islander
 Black or African American
 White
 More than one race – Black and White
 More than one race – Other
 Other or Unknown

5) Is English your native language? Yes No

If no, please list your native language: _____

6) What country were you born in? _____

7) On a scale of 1-7, how important is it to you to receive SONA credits in this study? (Circle one)

Not at all important – 1 2 3 4 5 6 7 – Extremely important

8) In your own words, what do you think the current study was about? Did anything seem strange or out of the ordinary when you were participating?

Vita

Anna Maria Catherine Behler was born on August 30, 1989, in Queens, New York. She graduated from The Mary Louis Academy, Queens, New York in 2007. She received her Bachelor of Science in Psychology from Fordham University, The Bronx, New York in 2011. She received a Master of Arts in Psychology from City University of New York, Queens College, Queens, New York in 2014. While at Queens College, she worked for 3 years as an adjunct professor of psychology and research assistant in the Attachment, Personality, and Emotion Lab under Dr. Claudia Brumbaugh.