## Supplemental Materials for Zhang & Epley

We observed significantly different patterns of correlations in Experiments 1 and 2 across our experimental conditions. One possible concern is that these different patterns emerged because of ceiling effects or range restrictions on one or both of our dependent measures in some of the conditions but not others. In these supplemental materials, we present evidence assessing the validity of this concern in considerably more detail than space allows in the main document.

In particular, it is possible that gift receivers evaluated liked gifts so positively that a significant positive correlation equivalent to what we observed in the disliked condition was suppressed due to a ceiling effect. Like a person who measures the correlation between shoe size and height with a ruler that only measures up to 4 feet, a positive correlation could be suppressed by a measure that does not include the full range of observations. If the ceiling of our positive evaluation measure is somehow artificially low (perhaps one person's maximum rating of 9 is only half as positive as another person's positive evaluation of 9), then a positive correlation could be suppressed. For instance, in Figure 1 below, the panel on the left is a theoretical distribution in which the ceiling of the positive evaluation measure captures none of the actual variability at the top of this scale. The panel on the right is the actual distribution that would emerge if the ceiling was lifted in a way that allowed true sensitivity to the complete range of positive evaluations. The correlation on the left is 0, but the correlation on the right is 1.

Figure 1. **Positive correlation masked by a ceiling effect vs. actual positive correlation.**
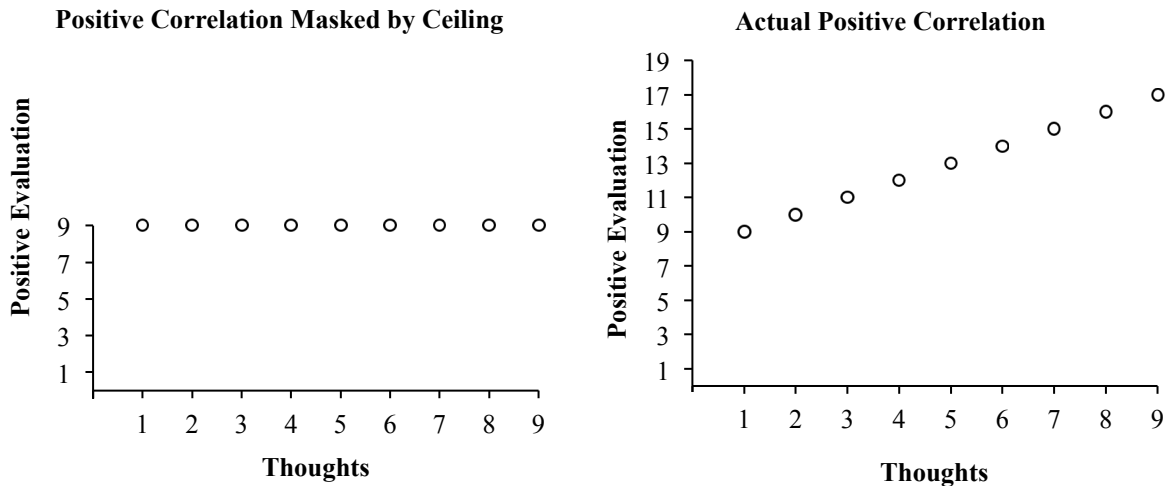
Our account, in contrast, is that thoughtful gifts produce more appreciation and gratitude than thoughtless gifts, but that receivers consider a gift giver's thoughts only when triggered to do so. A failure to evaluate thoughtful gifts more positively than thoughtless gifts therefore comes from failing to consider a gift giver's thoughts. Theoretically, this account could yield a pattern of observations at the ceiling of positive evaluations across the entire range of presumed thoughts, as shown in Figure 2 below. The panel on the left is the theoretical relationship between a receiver's positive evaluations and a gift giver's thoughts when receivers are triggered to consider those thoughts. The panel on the right is a theoretical relationship between thoughts

and positive evaluations when gift receivers fail to think of a giver's thoughts. Notice the relationship on the right is at ceiling of positive evaluations across the entire range of presumed thoughtfulness. The correlation on the left is 1 and the correlation on the right is 0. Our acount does not assume any additional variability in evaluations beyond the ceiling of our measures.

Figure 2. **Theoretical prediction for disliked gifts vs. liked gifts.**
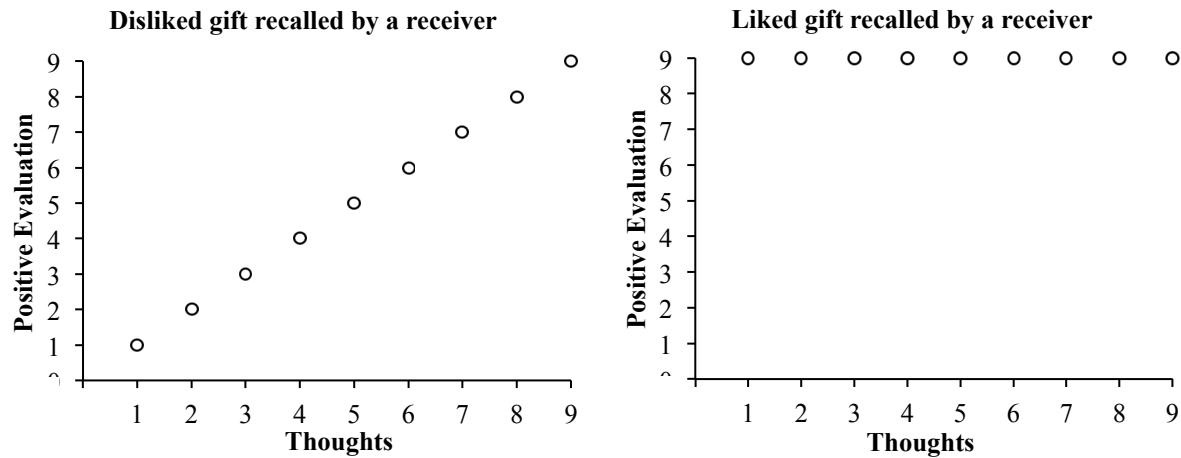
On our account, if one was to theoretically lift the ceiling of the positive evaluation measure as in Figure 1, the correlation would remain unchanged. Like untethered helium-filled balloons, positive evaluations would simply rise to the new ceiling. There would still be no significant relationship between a receiver's positive evaluation and a gift giver's presumed thoughtfulness.

In these supplemental materials, we assess in as many ways as we can identify whether the pattern of distributions we observe looks more like those in Figure 1, consistent with the alternative that a positive correlation is suppressed by a ceiling effect, or Figure 2, consistent with our account that a null correlation is produced by failing to be triggered to think of a gift giver's thoughts.
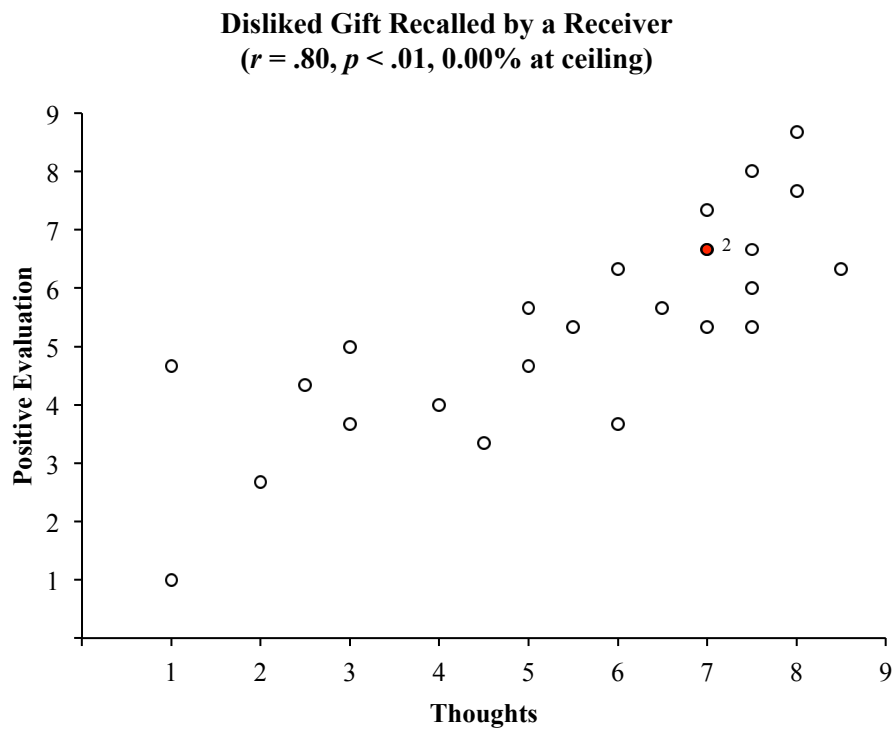
Experiment 1

As can be seen in Table 1 below, there is clear evidence of more evaluations at the ceiling in some conditions than others. In particular, 72% of evaluations are at the ceiling of one of the two measures for gift receivers recalling a liked gift.

Table 1. **Percentage of responses at ceiling of either positive evaluation or thoughts measure.**
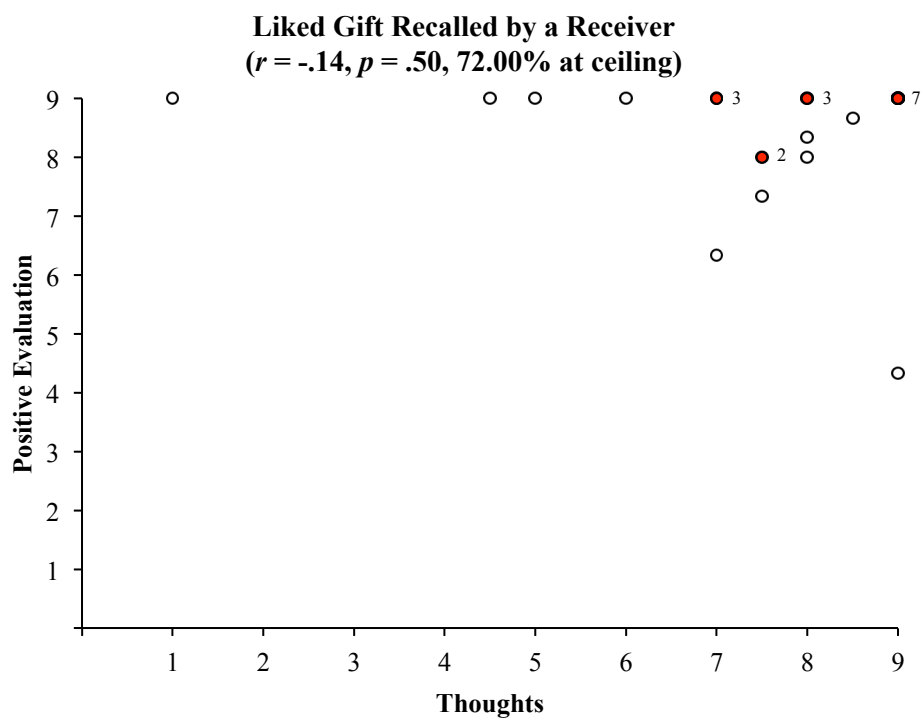
	Percentage of responses at ceiling	
	Liked gift	Disliked gift
Receivers	72.00%	0.00%
Givers	44.44%	13.64%

The exact distributions for all four experimental conditions are presented in the scatterplots below as Figures 3, 4, 5, and 6. In these scatterplots, red markers indicate duplicate points. The number to the right of each red marker indicates the number of observations at that point.
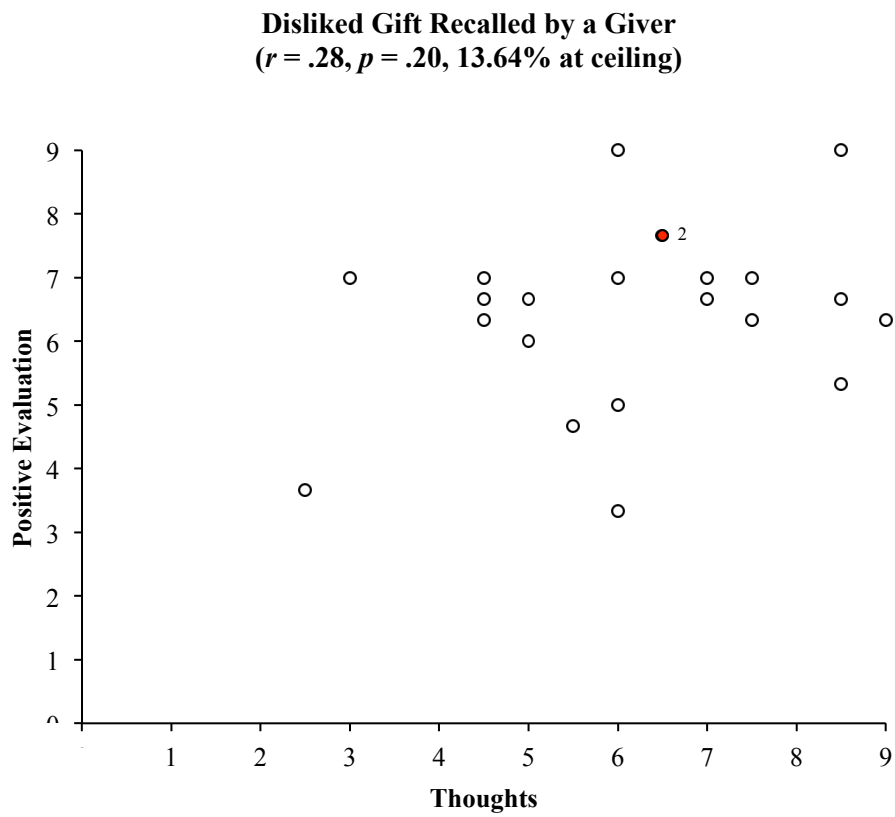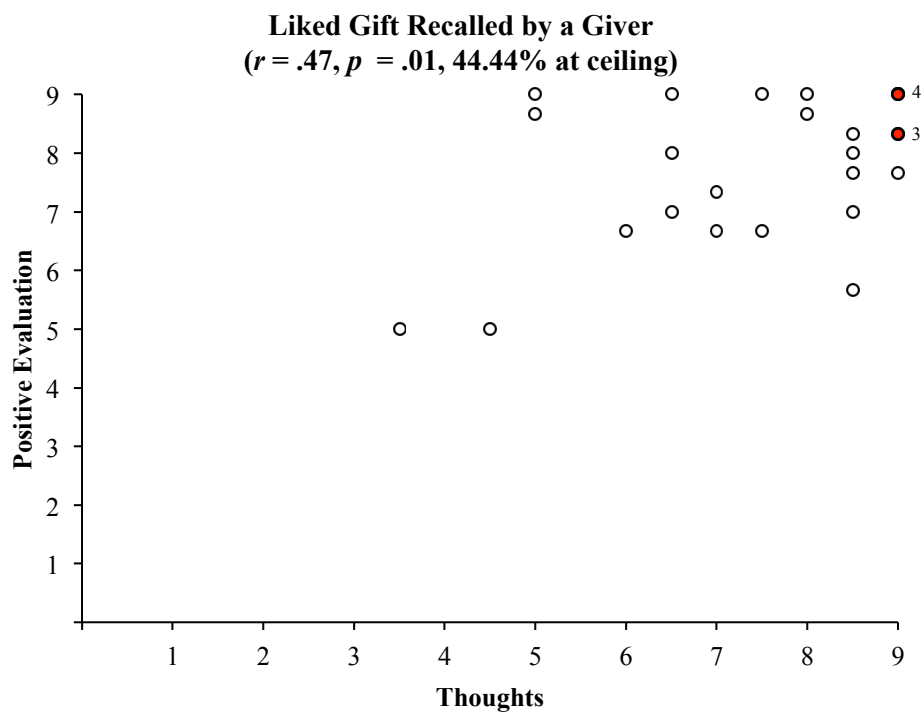
Figure 3.

Disliked Gift Recalled by a Receiver
(*r* = .80, *p* < .01, 0.00% at ceiling)

Figure 4.

Liked Gift Recalled by a Receiver
(*r* = -.14, *p* = .50, 72.00% at ceiling)

Figure 5.

Disliked Gift Recalled by a Giver
(*r* = .28, *p* = .20, 13.64% at ceiling)

Figure 6.

Liked Gift Recalled by a Giver
(*r* = .47, *p* = .01, 44.44% at ceiling)

As can be seen in these scatterplots, the most observations at the ceiling of the positive evaluation and thought measures occurs in the condition where gift receivers are recalling a liked gift. We assess whether these observations at ceiling masked an actual positive correlation, like the positive correlation observed among gift receivers recalling a disliked gift, in three ways.

First, we assessed whether it was even theoretically possible to obtain a significant correlation, given the ranges of observations we actually observed in each of our conditions, or whether the range was so suppressed by a ceiling effect that a correlation was theoretically impossible. To do that, we broke the dependency between thoughts and positive evaluation for each individual participant and simply rank ordered the two dependent measures to identify the maximum positive and negative correlation that could have been observed in each of the four conditions given the responses obtained. The results are presented below in Table 2.

Table 2. **Maximum possible correlation in Experiment 1.**

	Positive correlation		Negative correlation	
	Liked gift	Disliked gift	Liked gift	Disliked gift
Receivers	.95(<.01)	.97(<.01)	-.41(<.05)	-.95(<.01)
Givers	.98(<.01)	.95(<.01)	-.77(<.01)	-.92(<.01)

These results simply show that there is enough variability in all conditions in this experiment for a strong positive correlation to emerge. The restricted ranges of observations alone was not sufficient to produce the nonsignificant correlations we observe among receivers in the disliked gift condition.

Second, we assessed the correlations between thoughts and positive evaluations using Tobit regressions rather than Pearson correlations. A Pearson correlation treats an observation at the ceiling of a given measure as the true value of the observation, whereas a Tobit regression treats an observation at the ceiling of a measure as equivalent to that observation or greater. Tobit regressions are designed specifically for cases in which observations are censored by ceiling (or floor) effects. In our data, a Tobit regression tests the potential relationship between positive evaluations and a gift giver's thoughts if you were to remove the ceiling on the positive evaluation measure. As shown below in Table 3, Tobit regressions produce the same pattern of correlations across experimental conditions as the Pearson correlations.

Table 3. **Tobit regression for Experiment 1.**

	Tobit regression coefficients (p-value in parenthesis)	
	Liked gift	Disliked gift
Receivers	-0.38 (.41)	0.62 (<.0001)
Givers	0.43 (.02)	0.25 (.17)

For gift receivers recalling a liked gift, there is no evidence at all of a suppressed positive correlation. If anything, the relationship between thoughts and positive evaluations becomes more *negative* when the impact of a ceiling effect is reduced.

Another way to raise the ceiling on the thought and positive evaluation measure, aside from the Tobit regression, is to perform a reflected log transformation on all observations to reduce the negative skew. We did so on the two measures for the liked gift condition using this formula: $Measure_{transformed} = -\log(-Measure_{original} + 10) + constant$). The resulting correlation among gift receivers in the liked gift condition ($r = -.05, p = .80$) was nearly identical to the correlation observed in the raw data ($r = -.14, p = .5$). There is no evidence that a disproportionate number of observations at the ceiling in this condition are responsible for the absence of a correlation in this condition.

Third, instead of assessing the consequences of lifting the ceiling on our critical dependent variables in the liked gift condition, we assessed the consequences of *creating* a ceiling effect on our dependent variables in the disliked gift condition. The concern about a ceiling effect among gift receivers is that the actual correlation between positive evaluations and presumed thoughts is the same when receivers recall a liked versus disliked gift, but that this correlation can only be observed in the disliked gift condition due to the *absence* of a ceiling effect. If this is correct, and if the distributions for gift receivers are actually the same between liked and disliked gifts, then the strong positive correlation we observe in the disliked gift condition should be eliminated if we create a ceiling effect in the distribution of this condition.

To assess this, we truncated the distribution across the entire range of the positive evaluation and thought measures to create varying degrees of ceiling effects, from modest censoring of observations to severe censoring. The results are presented below in Table 4.

Table 4. **Truncated correlations in the disliked gift condition for receivers in Experiment 1.**

Ceiling*	Number of Obs. at ceiling (percentage in parenthesis)	Correlation (p-value in parenthesis)
No truncation, $(9, 9)$	0 (0%)	.80 $(< .01)$
Truncated at $(7.5, 6.3)$	11 (44%)	.80 $(< .01)$
Truncated at $(7.5, 5)$	16 (64%)	.67 $(< .01)$
Truncated at $(6.5, 5)$	16 (64%)	.68 $(< .01)$
Truncated at $(6, 5)$	17 (68%)	.67 $(< .01)$
Truncated at $(4, 4)$	22 (88%)	.64 $(< .01)$
Truncated at $(3, 3)$	23 (92%)	.68 $(< .01)$
Truncated at $(2, 2)$	24 (96%)	.69 $(< .01)$

* The first number in parentheses indicates the ceiling for the thoughts measure, and the second number indicates the ceiling for the positive evaluation measure.
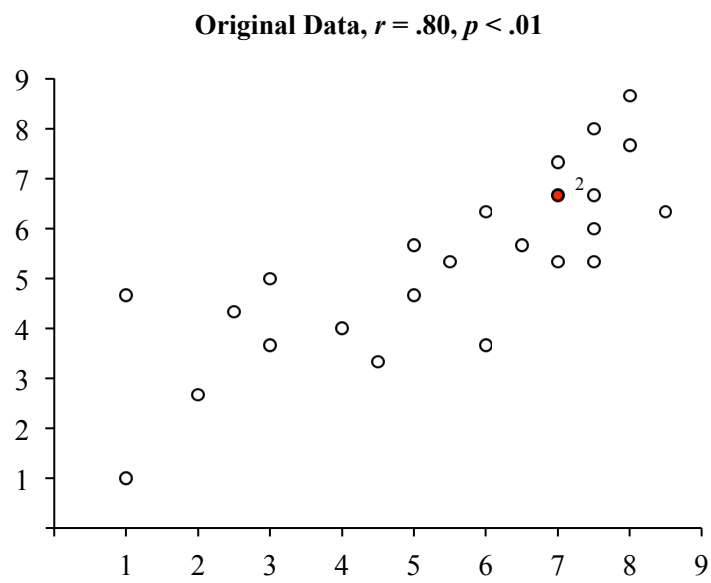
The first of these truncated distributions mimics, roughly, the number of observations at the ceiling of both positive evaluation and thoughts measures among gift receivers in the liked gift condition. The other truncation points are arbitrary, simply increasing in the severity of the ceiling effect. At no point do we observe a correlation that even vaguely resembles the correlation observed among gift receivers in the liked gift condition ($r = -.14$). This provides evidence that the distributions among gift receivers in the liked gift and disliked gift condition are different from each other. There is no evidence in these data that creating a ceiling effect would cause these two distributions to look similar to each other.

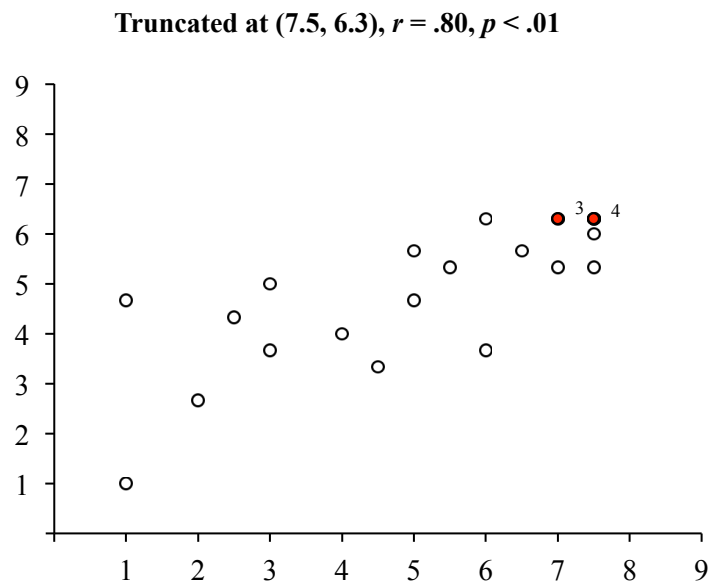The scatterplots for all of these distributions summarized in Table 4 are presented below in Figures 7-14.

All of these analyses for Experiment 1 provide evidence against concerns about a ceiling effect suppressing a genuine positive correlation among gift receivers recalling a liked gift. Instead, they all support the existence of a genuine nonsignificant relationship, consistent with our theoretical account.
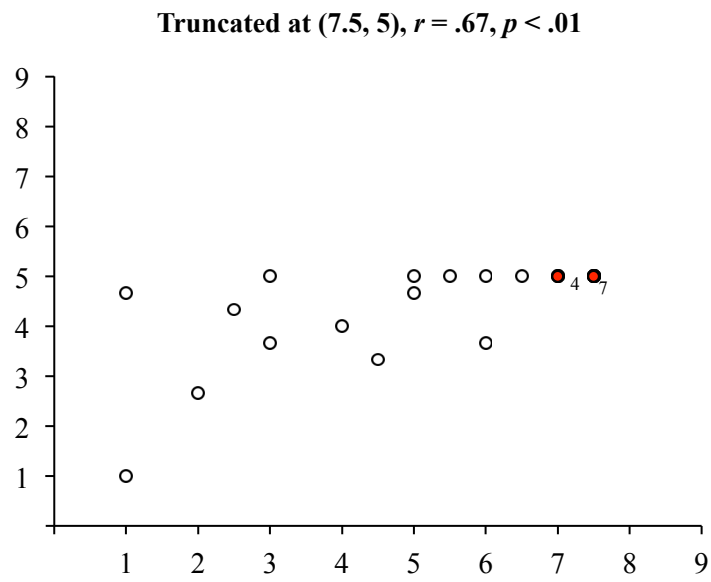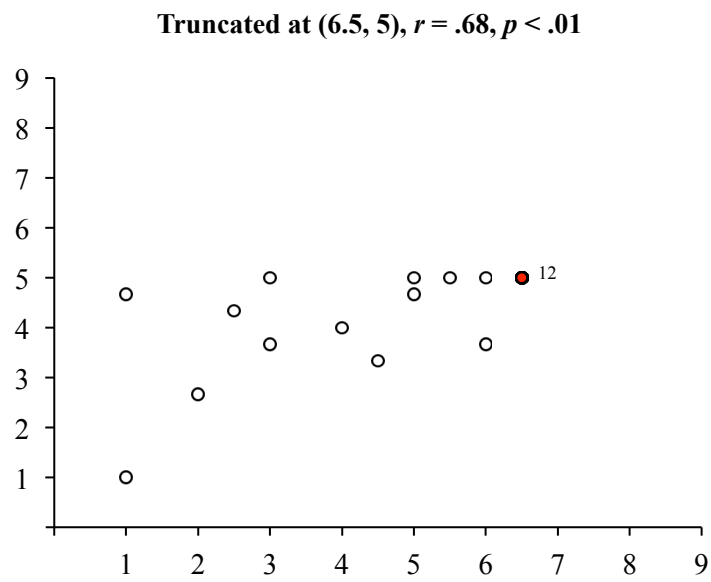
Figure 7.

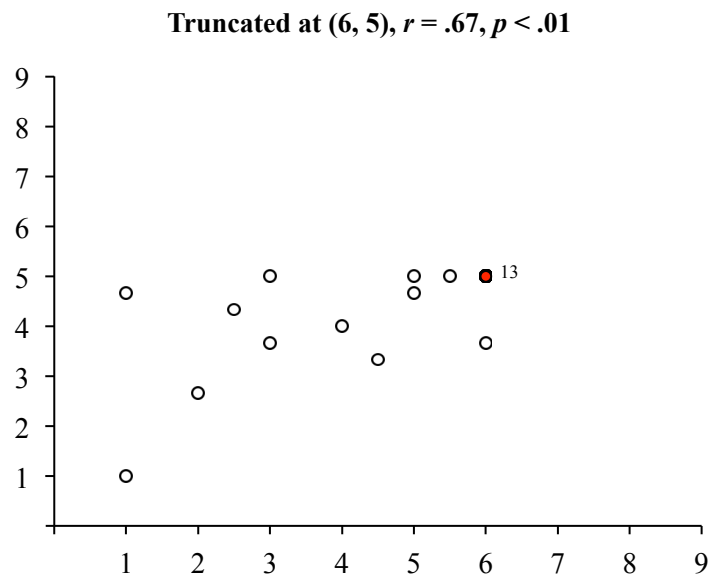**Original Data, *r* = .80, *p* < .01**

Figure 8.

Truncated at (7.5, 6.3), *r* = .80, *p* < .01

Figure 9.

Truncated at (7.5, 5), *r* = .67, *p* < .01

Figure 10.

Truncated at (6.5, 5), *r* = .68, *p* < .01

Figure 11.

Truncated at (6, 5), *r* = .67, *p* < .01

Figure 12.

Truncated at (4, 4), *r* = .64, *p* < .01

Figure 13.

Truncated at (3.3), $r = .68$, $p < .01$

Figure 14.

Truncated at (2, 2), $r = .69$, $p < .01$
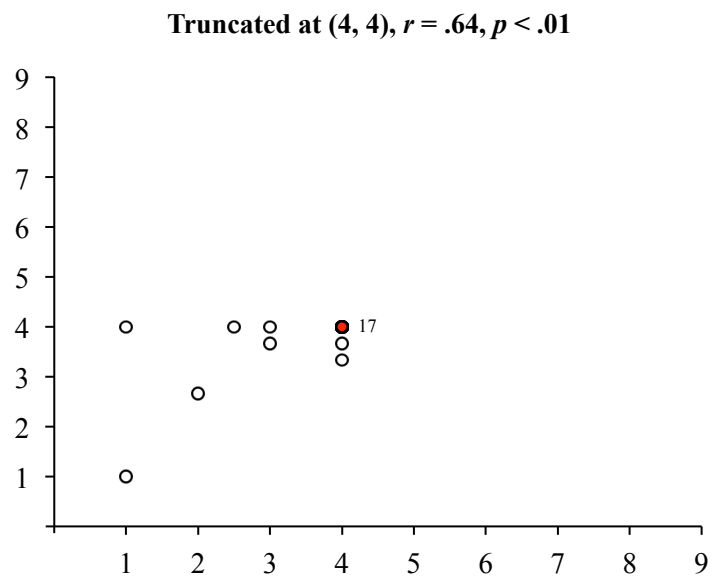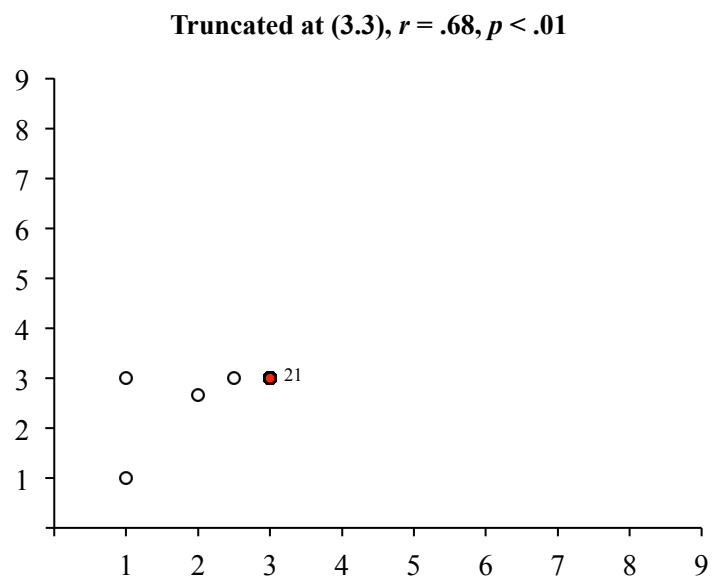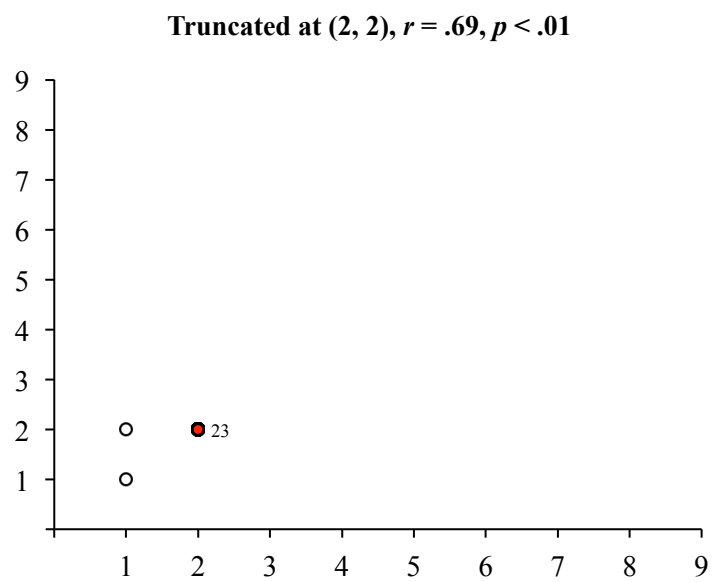
Experiment 2

Experiment 2 manipulated whether participants were explicitly asked to think about a gift giver's thoughts or not before reporting their positive evaluations (of appreciation and gratitude). We predicted that this explicit trigger would bring gift receivers' positive evaluations in line with the gift giver's presumed thoughtfulness for both disliked as well as liked gifts. That is, even for liked gifts, we predicted that gifts given more thoughtlessly would produce more negative evaluations than gifts chosen thoughtfully. When not explicitly triggered to consider a gift giver's thoughts, we predicted that receivers would show a correlation between positive evaluations of the exchange and a gift givers presumed thoughts only when recalling a disliked gift. As in Experiment 1, we predicted that gift receivers recalling a liked gift would evaluate the gift positively regardless of the amount of thought gift givers presumably put into the gift because they were not triggered to think of a giver's thoughts.

Our results support this prediction. To assess whether a ceiling effect could again be suppressing an actual positive correlation among gift receivers in some conditions (in particular, among gift receivers recalling a liked gift in the thoughts last condition), we conducted the same supplemental analyses as we did for Experiment 1.
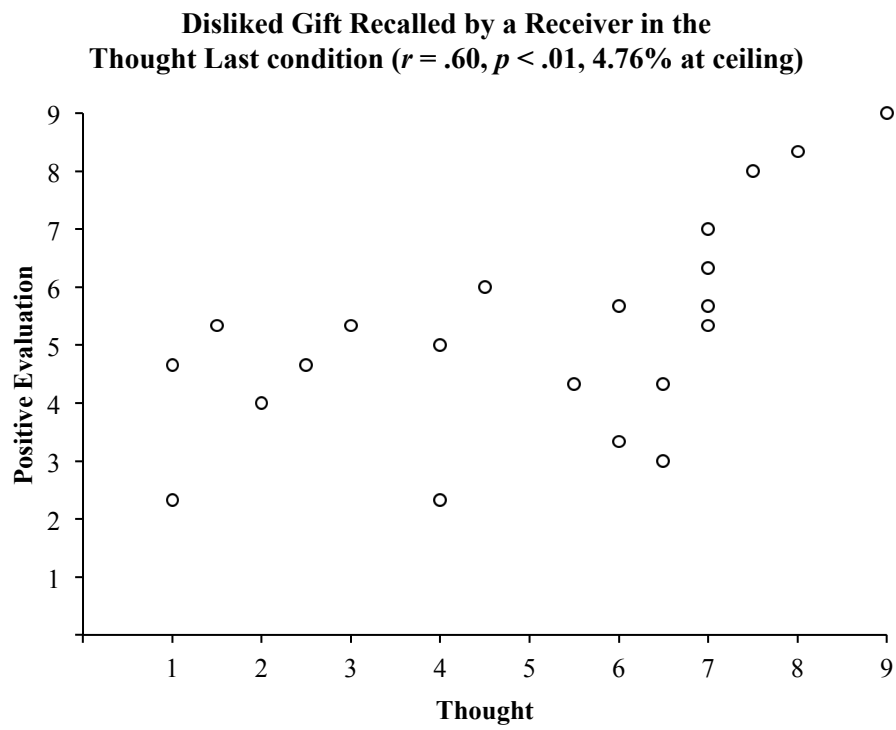
As in Experiment 1, there are more observations at the ceiling of our dependent measures among receivers evaluating liked gifts than in any of the other conditions. There is not, however, a marked difference in the percentage of observations at ceiling between gift receivers in the thoughts first versus thoughts last conditions, and yet we observe very different patterns of correlation between these two conditions. The percentage of observations at the ceiling of either the positive evaluation or thoughts measure are shown below in Table 5.

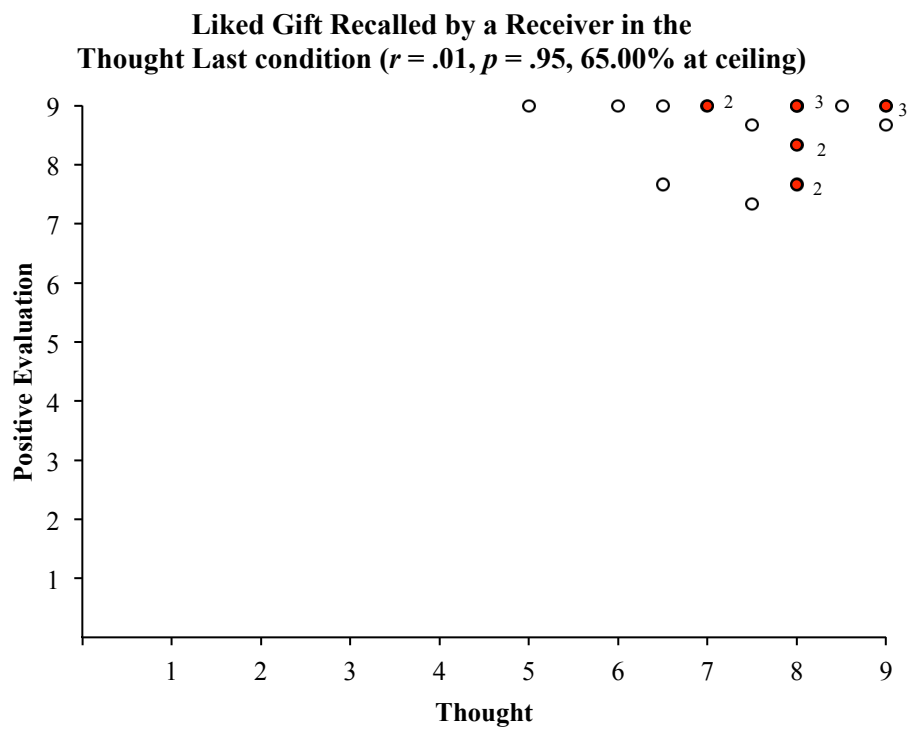*Table 5*. **Percentage of responses at ceiling in Experiment 2.**

	Percentage of responses at ceiling	
	Liked gift	Disliked gift
Thoughts First		
Receivers	57.89%	4.55%
Givers	47.37%	10.53%
Thoughts Last		
Receivers	65.00%	4.76%
Givers	30.00%	14.29%

The exact distributions for all eight experimental conditions are presented in the scatterplots below as Figures 15-22. In these scatterplots, red markers indicate duplicate points. The number to the right of each red marker indicates the number of observations at that point.
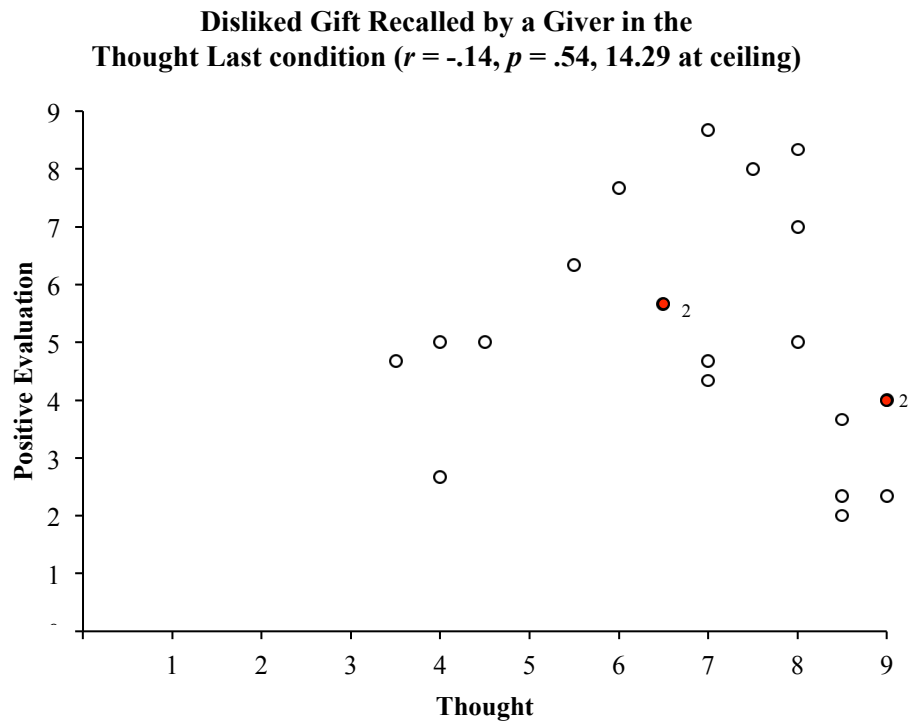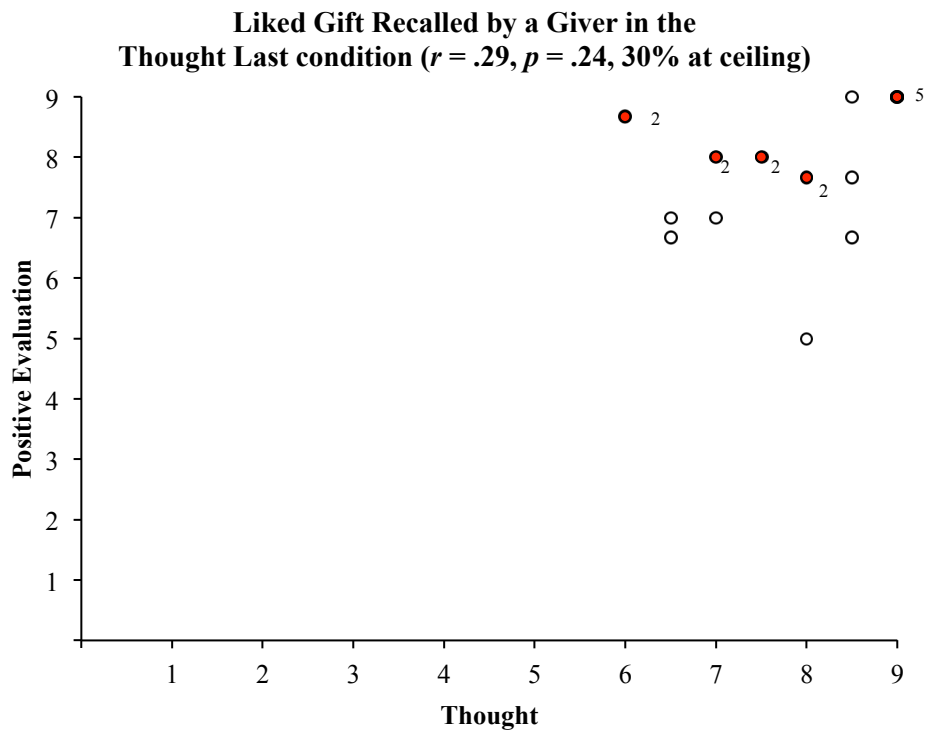
Figure 15.

Disliked Gift Recalled by a Receiver in the
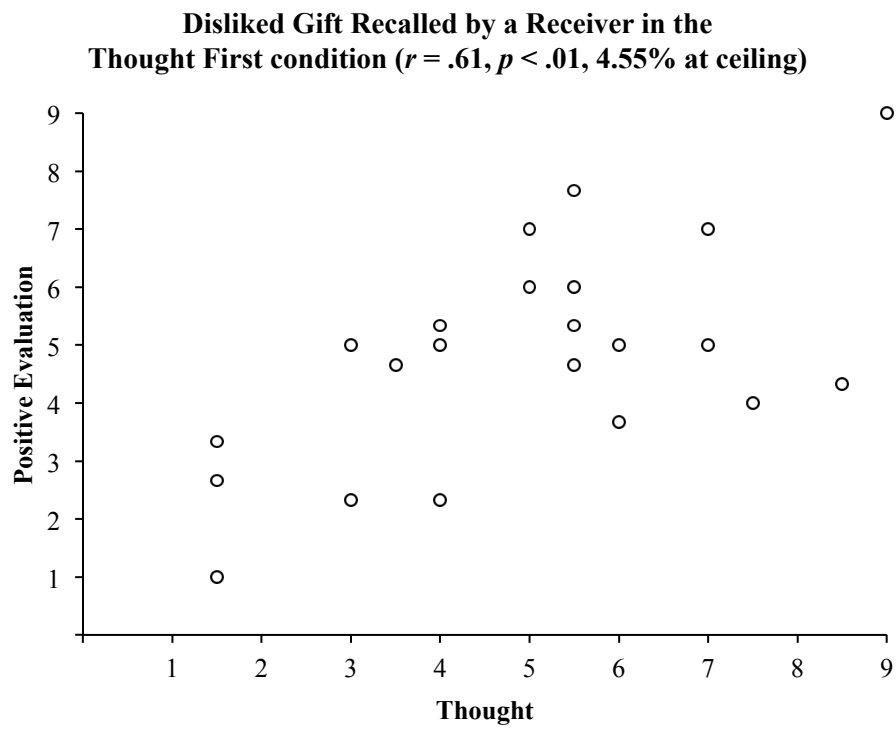**Thought Last condition (*r* = .60, *p* < .01, 4.76% at ceiling)**

Figure 16.

Liked Gift Recalled by a Receiver in the
Thought Last condition (*r* = .01, *p* = .95, 65.00% at ceiling)

Figure 17.

**Disliked Gift Recalled by a Giver in the
Thought Last condition (*r* = -.14, *p* = .54, 14.29 at ceiling)**

Figure 18.

**Liked Gift Recalled by a Giver in the
Thought Last condition (*r* = .29, *p* = .24, 30% at ceiling)**

Figure 19.

Disliked Gift Recalled by a Receiver in the
Thought First condition (*r* = .61, *p* < .01, 4.55% at ceiling)

Figure 20.

Liked Gift Recalled by a Receiver in the
Thought First condition (*r* = .62, *p* < .01, 57.89% at ceiling)

Figure 21.

Disliked Gift Recalled by a Giver in the
Thought First condition ($r = .35$, $p = .14$, 10.53% at ceiling)

Figure 22.

Liked Gift Recalled by a Giver in the
Thought First condition ($r = .49$, $p < .05$, 47.37% at ceiling)

First, we again assessed the maximum possible correlations in each of our experimental conditions. The results are shown below in Table 6. As in Experiment 1, it is at least theoretically possible to obtain strong positive correlations, given the data we actually observed, in all of our experimental conditions.

Table 6. **Maximum possible correlation in Experiment 2**

	Positive correlation		Negative correlation	
	Liked gift	Disliked gift	Liked gift	Disliked gift
Thoughts First				
Receivers	.96 (<.01)	.97(<.01)	-.63(<.01)	-.97(<.01)
Givers	.87 (<.01)	.90(<.01)	-.57(=.01)	-.93(<.01)
Thoughts Last				
Receivers	.94 (<.01)	.92 (<.01)	-.72(<.01)	-.96(<.01)
Givers	.94 (<.01)	.94 (<.01)	-.87(<.01)	-.98(<.01)

Second, we analyzed our data using Tobit regressions instead of Pearson correlations. As in Experiment 1, doing so does not alter the results meaningfully. In particular, there is still no significant positive relationship observed in among gift receivers considering a liked gift in the thoughts last condition ($B = -.07, p = .83$). The Tobit regression did show a significant positive relationship between thoughts and positive evaluations for liked gifts in the thought last condition, but it was among givers ($B = .65, p < .05$), not receivers. If anything, these analyses suggest that a ceiling effect for liked gifts may be suppressing a positive relationship between thoughts and predicted positive evaluations among gift *givers*, but it does not suggest any suppressed correlation among gift receivers. This provides further support for our prediction that gift givers would fail to predict when their thoughts would count for gift receivers and when they would not. The Tobit regression results are presented below in Table 7.

Table 7. Tobit Regression for Experiment 2:

	Tobit regression coefficients (p-value in parenthesis)	
	Liked gift	Disliked gift
Thoughts First		
Receivers	0.74 (< .01)	0.57 (<.01)
Givers	1.00 (.01)	0.25 (.10)
Thoughts Last		
Receivers	-0.07 (.83)	0.46 (< .01)
Givers	0.65 (<.05)	-0.16 (.51)

As with Experiment 1, we also normalized the distribution in the gift receiver/disliked gift/thoughts last condition using a reflected log transformation. Doing so did not produce a significant correlation in this condition, $r(17) = .10, p = .68$.

Third, we again truncated the distribution of responses among gift receivers evaluating a disliked gift in the thoughts last condition (the analogous condition in Experiment 1). Truncating the distribution produced more modest correlations overall than what we observed in Experiment 1, presumably because the actual correlation in this experiment was weaker to begin with (.59 instead of .80 in Experiment 1). The correlations observed from the truncated distributions are shown below in Table 8.

Table 8. **Truncated correlations for gift receivers evaluating a disliked gift in the thoughts last condition.**

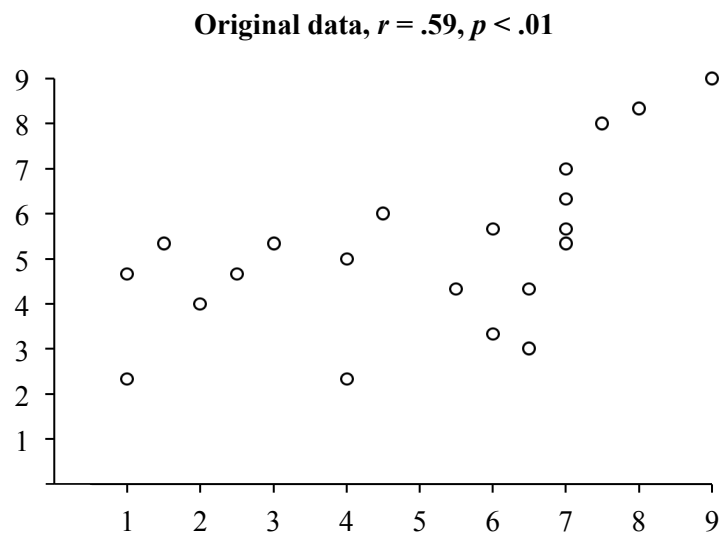| Ceilings*	Number of Obs. at ceiling (percentage in parenthesis)	Correlation (p-value in parenthesis)
No truncation, (9, 9)	1 (5%)	.59 (< .01)
Truncated at (7, 6)	8 (38%)	.41 (.06)
Truncated at (7, 5)	12 (57%)	.28 (.22)
Truncated at (7, 4)	17 (81%)	.24 (.30)
Truncated at (7, 3)	19 (90%)	.36 (.11)
Truncated at (6, 4)	19 (90%)	.21 (.36)
Truncated at (6, 3)	19 (90%)	.35 (.11)

* The first number in parentheses indicates the ceiling for the thoughts measure, and the second number indicates the ceiling for the positive evaluation measure.

These results suggest that a ceiling on this distribution could reduce a significant correlation of .59 quite considerably. At no point, however, do we observe a correlation as small as what we observed among gift receivers evaluating a *liked* gift in the thoughts last condition (*r* = .01). This particular analysis suggests that the significant correlation of .59 we observed could be suppressed considerably by ceiling effects, but it does not demonstrate that it would be directionally eliminated altogether. The scatterplots for all of these truncated distributions are presented below as Figures 23-29.
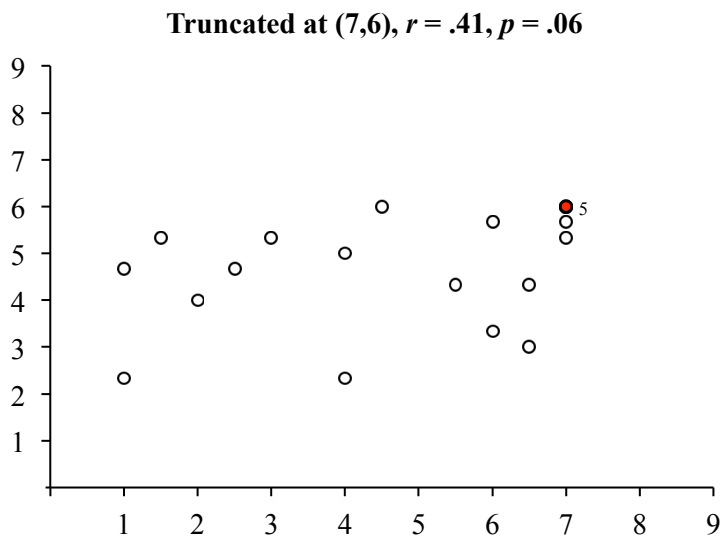
Conclusion

These analyses provide no evidence that ceiling effects are suppressing an otherwise significant positive correlation among gift receivers in either Experiments 1 or 2.
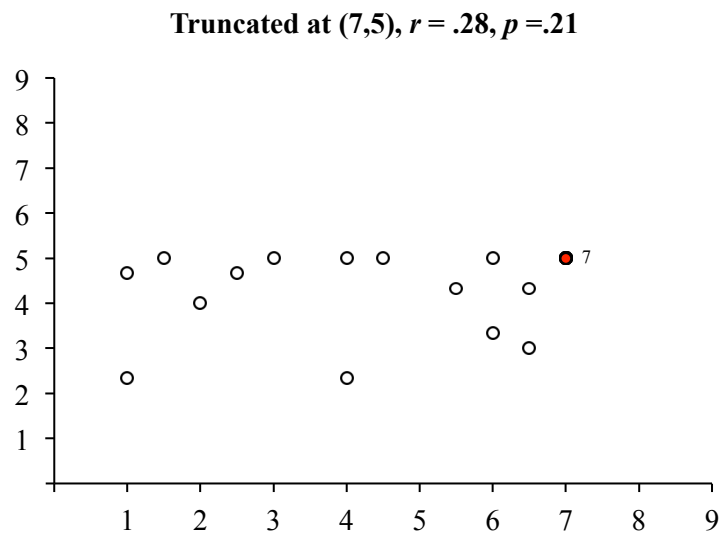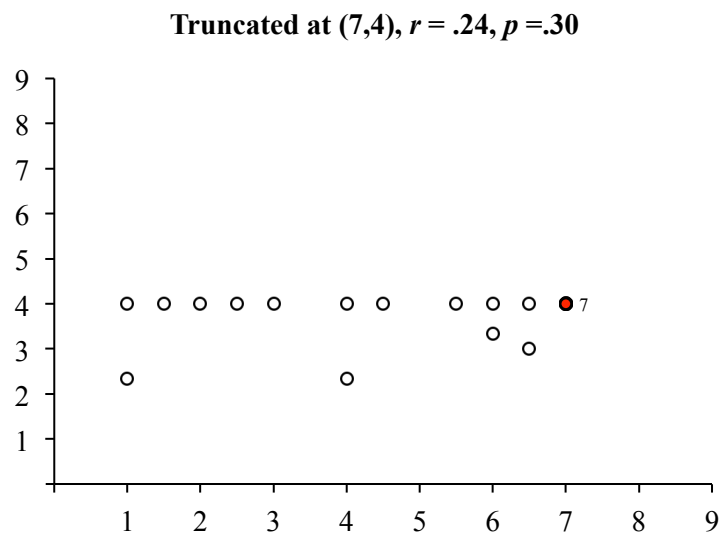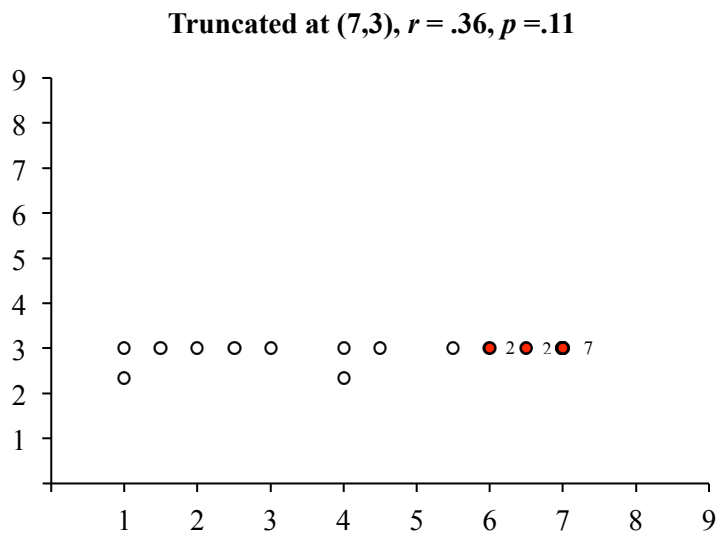
Figure 23.

Original data, *r* = .59, *p* < .01

Figure 24.

Truncated at (7,6), *r* = .41, *p* = .06

Figure 25.

Truncated at (7,5), *r* = .28, *p* =.21

Figure 26.

Truncated at (7,4), *r* = .24, *p* =.30

Figure 27.

Truncated at (7,3), *r* = .36, *p* =.11

Figure 28.

Truncated at (6,4), *r* = .21, *p* = .36

Figure 29.

Truncated at (6,3), *r* = .35, *p* = .11