

When letter writing increases kindness: Regulating emotions or activating pro-social thinking?

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Abstract

Previous experiments suggest a chain of unkindness: unkindly treated people pass on unkind behavior to an innocent third person. As a remedy, it has been proposed that the unkindly treated person writes a letter to the unkind person. Indeed, unkindly treated subjects who were writing letters have been found to be more kind to an innocent third person than unkindly treated subjects that were not writing letters. As an explanation, it has been suggested that letter writing helps writers to ‘close the case’ and thereby regulate their emotions. We propose an alternative explanation for this behavior: letter writing might activate more pro-social modes of thinking - irrespective of how the letter writer was treated before. Here, we examine how letter writing affects kindly treated subjects and compare this effect to that on unkindly treated subjects using an experiment. We find that letter writing increases giving to an innocent third person in both groups, suggesting that letter writing activates more pro-social modes of thinking.

Keywords: pro-sociality, chain of unkindness, letter writing, experimental economics

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1 Introduction

Anecdotal as well as experimental evidence suggests that people pass on unkind behavior (Ben-Ner et al., 2004; Gray et al., 2014). For example, Strang et al. (2016) show that an individual (person *B*), after receiving little money from his boss (person *A*), also passes on little money to a completely innocent party (person *C*). Understanding chains of unkindness and what can be done against them is crucial for firms and institutions who want to prevent the spread of unfair, inefficient, or unproductive behavior within their organizations.

In a recent study, Strang et al. (2016) suggest a remedy against the chain of unkindness: using an emotion regulation strategy, such as message writing. Subjects in the role of the unkindly treated person *B*, who write a letter to the unkind person *A*, subsequently pass on significantly more money to an innocent third persons *C*, relative to those subjects who are not given the option to write a letter but simply wait. The authors argue that writing a letter helps person *B* to emotionally ‘close the case’. Hence, letter writing should affect the mood of subjects in the role of *B* more positively than waiting. On the one hand, this is exactly what Strang et al. (2016) find. On the other hand, Schnedler and Stephan (2018) observe that self-reported happiness is not differently affected by letter writing, compared to waiting.

In the present paper, we consider an alternative explanation for the effect of letter writing that is consistent with subjects remaining unhappy: Any letter is addressing a specific audience. Thus, at the time of writing, subjects are more likely to think about others, compared to subjects who spend their time waiting. In order to get their message across, they need to put themselves into the readers’ shoes, i.e. by selecting the right language. Therefore, being given the opportunity to write a letter might activate more pro-social modes of thinking than having to wait. This difference may then translate into larger amounts of money passed on by writers, compared to subjects who wait instead.¹

If social modes of thinking are activated, not only unkindly but also kindly treated subjects should give more when they write rather than wait. In contrast, the ‘closing the case’ explanation by Strang et al. (2016) predicts that writing a letter has different effects on kindly treated subjects compared to unkindly treated subjects: if anything, kindly treated subjects should give less after regulating their (positive) emotions with the letter.

Our experiment directly tests which explanation is more suitable by exploiting the different predictions. We find that the effect of letter writing is similar for unkindly and kindly treated subjects: in both groups, letter writing increases the amount of money being passed on to the innocent third party. This is consistent with the explanation that letter writing activates pro-social modes of thinking, and rather not in line with the ‘closing the case’ explanation.

In addition to this central finding, our data offer an interesting unexpected finding. While being treated unkindly, rather than kindly, strongly and persistently reduces the happiness of subjects in the role of *B*, it does not affect how much money is passed on to the innocent third person. We thus find no evidence for a chain of unkindness.

In our experiment, kind and unkind behavior is induced by giving a randomly chosen boss (*A*) the authority to assign a relatively pleasant or unpleasant task to the other subjects

¹ Studies using functional Magnetic Resonance Imaging show that when certain brain regions, associated with perspective-taking, are active, this is associated with increased altruistic giving (Morishima et al., 2012) but they do not use letter writing as a manipulation.

(in the role of B).² The pleasant task consists in watching and rating a series of funny video clips, while the unpleasant task involves encrypting meaningless codes. After finishing their respective tasks, subjects in our L treatment are given the opportunity to write a letter to A , while those in the W treatment have to wait. Finally, subjects are endowed with money, and decide whether to pass on part of the money to an innocent person (C), who is not taking part in the present experiment. A detailed description of the experimental design follows in Section 2.

Our design involves a sequence of three players, similar to experiments on third-party punishment (e.g. Fehr and Fischbacher, 2004; Rand and Nowak, 2013; Nelissen and Zeelenberg, 2009). The crucial difference is that the third ‘player’ C is not active or even present in our experiment. More importantly, our key question is not how C ’s possible punishment affects A ’s behavior toward B , but how B ’s behavior toward C is affected by letter writing.

We measure the passing on of unkindness using the dictator game. The wide-spread use of the dictator game (Engel, 2011) has been criticized as ‘searching near the lamppost’ (Oechssler, 2010). While there is some debate on whether giving in the dictator game actually measures altruism (e.g. Bardsley, 2008; List, 2007), giving is clearly kind to the receiver. This justifies its use here and more generally in the literature on the chain of unkindness. Moreover, our results become directly comparable to this literature (e.g. Ben-Ner et al., 2004; Diekmann, 2004; Bahr and Requate, 2014).

Since in our experiment we observe how letter writing affects pro-social choices in a dictator game, our study adds to a growing literature using experiments to investigate how pro-social decision making in the monetary domain is affected by soft factors outside the monetary domain, such as context or emotions. For example, Fukui and Toyoshima (2014) show that listening to preferred music increases pro-social behavior in a dictator game. Or, Capra (2004) finds that non-monetarily inducing a good mood increases pro-social choices in a dictator, and an ultimatum game. In contrast to these and similar existing studies, we shed light on how and why letter writing might affect pro-sociality.

To the best of our knowledge, there are only two existing experimental economic studies on the effect of letter writing: Xiao and Houser (2005) and Xiao and Houser (2009). In their 2005 study, the authors find that letting subjects B write a letter to A reduces their willingness to punish A . In their 2009 study, they re-investigate their 2005 data and find that dictators who anticipate receiving a letter are less likely to share unfairly in a dictator game. They conclude, that letter writing works as an efficient and cheaper form of sanctioning. The present paper adds to these studies on the effect of letter writing by exploring its effect on another outcome: the passing on of unkind behavior to an innocent third party.

Our experimental set-up draws its inspiration from the literature on chains of unkindness or kindness, which studies whether affected people pass this behavior on to an independent third party—a phenomenon also referred to as downstream indirect reciprocity (Mujcic and Leibbrandt, 2017) or generalized reciprocity (Herne et al., 2013). Mujcic and Leibbrandt, for example, find that people who have been let through at a car park crossing are more likely to let other people through later and Leimgruber et al. (2014) observe that children

²In real life, any task, depending on the subjective experience, can be perceived as either kind or unkind. The respective kind and unkind tasks in this study are thus meant to be more or less kind in relative terms. For the same reason, the kind task may also be regarded as neutral.

who receive a sticker from another child are more likely to give away a sticker to a third child. Others show that subjects behave more non-cooperatively after a non-cooperative experience (Rankin and Taborsky, 2009) or that subjects pass on less money in a dictator game after receiving little in a dictator game themselves (Diekmann, 2004; Strang et al., 2016). While these studies establish that a certain behavior is passed on, we examine how a proposed remedy against such chains operates.

Our paper most directly relates to Strang et al. (2016), who investigate letter writing as a remedy against the chain of unkindness. Probably the most important difference is that, whereas Strang et al. only have very few kindly treated subjects, in our study, half of the subjects experience kind behavior. With this balanced data set, the present paper is the first that allows studying and comparing the effect of letter writing on both, kindly and unkindly treated subjects. This enables us to contribute to existing literature by answering our central question: whether letter writing has a general pro-social effect, that is essentially the same among subjects previously treated kindly and unkindly, or whether it only helps unkindly treated subjects and is thus a remedy specifically aimed at the chain of unkindness.

The remainder of this paper is structured as follows. After an introduction to the experimental design in Section 2 and an overview of the implementation and descriptive statistics in Section 3, Section 4 summarizes the main results. Section 5 presents additional, incidental results, followed by a conclusion in Section 6.

2 Experimental Design

The experiment consists of three treatment variants: the letter writing treatment and two control treatments. In the following we describe the sequence and explain the design of the experiment. Then, building on existing findings, we explain the central hypotheses.

2.1 Sequence

The sequence follows naturally from the desire to study how unkind behavior gets passed on. In Part I, a subject is given the choice to assign an unkind and annoying tasks to others. In Part 2, in order to obtain kindly and unkindly treated subjects, some subjects are exposed to this task and others not. In Part 3, we apply the treatment, i.e., whether subjects have the opportunity to write a letter or not. In Part 4, we measure kindness toward the innocent third person.

Part 1: Assignment to roles and tasks

In order to induce unkind behavior to potentially start off a chain of unkindness, we need some participants who decide to be unkind to some, and kind to other participants. Therefore, in each session, one participant is randomly assigned to be the boss (*A*), and is offered a premium conditional on being unkind to some of the participants. All other participants are by default treated kindly. To make sure that participants hold the boss, and not the experimenter, responsible for their experience, the boss is responsible for deciding

which participants to treat unkindly. For the same reason, the boss is also given the option not to treat anyone unkindly, though this would mean forgoing the premium.

Except for the boss, all other participants are randomly assigned into pairs, each pair consisting of one player X and one player Y . All players X and Y are initially assigned to the task of rating movies (the default). Before the start of this task, however, the boss has to decide whether or not to assign either all players X or all players Y to an encryption task instead, which earns him the premium of 10 €. He then has to decide which group of participants, X or Y , to assign to this much less pleasant task, thereby being unkind to those who become encryptions and kind to those who remain raters.

Part 2: Pleasant versus unpleasant tasks

In order for subjects to feel kindly or unkindly treated, they all have to execute the task assigned to them by the boss. The rating task is designed to give the respective subjects a pleasant experience. The task of the raters is to watch short, funny videos. In order to make participants actively engage in this task, they are asked to rate the videos, by checking a box in case they enjoy watching it. To make sure the raters are well entertained throughout the duration of Part 2, a sufficient amount of videos is presented.

In contrast, the encryption task needs to be experienced as unpleasant, so participants perceive the boss's choice to assign them to this task as unkindness. We explain the six ways in which our design ensures that the encryption task is perceived as unkind in comparison to the rater task.

First, as stated by Benndorf et al. (2018), encryption tasks promise minimal learning, which reduces the chance for single participants to enjoy getting better at it. In our case, subjects have to convert sequences of numbers into meaningless combinations of letters. Second, encryptions sit in the same room as raters. They can hear raters laugh at the funny videos which makes them aware of the pleasant alternative experience that they miss due to the boss' decision. Third, the work of the encryptions is interrupted by annoying reminders from the boss, telling them to hurry up. These reminders appear on the encryptions' screens and have to be clicked away in order to return to the encryption task. After each reminder, the last encryption input is lost and has to be re-entered. Fourth, encryptions are put under time pressure by giving them an incentive to solve as many encryption tasks as possible, as quickly as they can. The incentive is that the experiment only continues once either, every encryption has solved an assigned but unknown minimum number of encryption tasks between 3 and 10, or, all participants end up waiting for only a few participants to finish at least their minimum. Fifth, both tasks are only rewarded by a rather symbolic payment of 0.10 €. This payment may feel inadequately low for someone engaged in encrypting. Sixth, to make the relative unfairness directly visible, participants receive 'feedback' on their own and their partners' performance. This includes information on how many videos were liked by the rater, and how often the encryption was interrupted by the boss.

2.1.1 Part 3: Treatments L and W

The next step differs across treatments. In the L treatment, all raters and encryptions are given three minutes to write a letter to the boss. Participants are notified that they have 3 minutes to write a letter to the boss by typing into the text field below the notification. In order to underline the real consequences of their decision in this stage, participants are also

informed that letters are printed and handed out to the boss at the end of the experiment. Whereas participants need to type at least one character into the text box before being able to send the letter and leave the stage early, we are aware that all participants can still freely choose whether and in what way to make use of the letter writing option.

In the W treatments, participants are not given the chance to write a letter. Instead, they wait for 3 minutes in order to ensure that the time that passes between the experience of kind and unkind behavior and the dictator decision is as long as in the L treatment. There are two variants of this treatment: W_0 and W_M . In the W_0 treatment, participants only wait. In the W_M treatment, participants are asked to answer a question while waiting.³

Part 4: Dictator game

In the last part of the experiment, we measure whether participants pass on unkind behavior. For making sure that participants actually decide to be unkind, and are not just imitating a choice previously made by someone else, we do not observe unkind action by observing the decision to assign yet another unkind task (mimicking the bosses' decision situation). Instead, unkind action is observed in a dictator game. This comes with the advantage that dictator game results are easy to compare both across treatments, and across raters and encrypters. Hence, we also learn whether kind behavior is passed on. A convenient side effect of designing this last part of the experiment as a dictator game is that it allows rating the participants' actions as more or less kind in the same way as done in previous studies (Strang et al., 2016; Gray et al., 2014; Ben-Ner et al., 2004): Each dictator receives 10 € and is asked to leave between 0 € and 10 € in increments of 1 € to a person C .

To avoid image concerns, we make sure that these persons C will never be in direct contact with the dictators. All participants are informed that person C is neither present in the laboratory nor participating in another session of the same experiment. Instead person C is a participant of a future, unrelated experiment, that is taking place later in the term.⁴

2.2 Elicitation of Happiness

In order to shed light on potential motives behind participants' choices, we elicit participants' happiness at different stages of the experiment. This allows us to measure how participants' happiness changes throughout the experiment, and whether it differs between treatments and assigned tasks. To facilitate comparison, we use the same method to elicit happiness as used by Strang et al. (2016) and first developed by Bradley and Lang (1994).⁵ In between the different stages of the experiments, all participants are asked to describe

³They were asked to report how much money (M) should be offered to make up for the kind or unkind experience. The intention was to keep the emotional experience vivid. We do not find this additional question to affect participants' behavior regarding any of the outcomes.

⁴Future participants were invited to different sessions in May, June, and September 2017. As part of these sessions, each future participant received the money left by one dictator of the present experiment.

⁵We are aware that despite using the same method of happiness elicitation, there may still be minor procedural differences compared to Strang et al. (2016), and that these may partly explain why happiness measures differ.

their current mood on a nine-point Likert scale by clicking on a respective symbol (*Self-Assessment Manikin*). This elicitation of happiness, or instantaneous mood, is done four times. First, before participants learn which task they are assigned to, and then repeated immediately after the end of the encryption or rater task respectively. Third, after the treatment, and fourth, after the dictator game.

2.3 Hypotheses

Letter writing can help regulating emotions. There are two ways how this may work: through emotional expression or emotional closure. First, Xiao and Houser (2005) suggest that letter writing is an outlet for emotional expression. They observe that people are less inclined to reject unfavorable offers if they can write a letter to the unfair proposer. According to them, unfairly treated people are emotionally charged and have a desire to express their emotion. If they cannot directly do so, they express themselves by rejecting the offer. If they can do so in a letter, they feel less need to reject the offer. Possibly, subjects charged with negative emotion generally seek the next outlet to express their emotion, and do so through an action, if no other outlet is available. Second, Strang et al. (2016) suggest that letter writing leads to emotional closure. By addressing the person that caused the negative emotions, it becomes easier to let go of the negative emotion. Both ways are in line with Damasio (1994), who describes that humans are inherently trying to avoid emotional pain, that may be caused by experiencing unkindness. According to Damasio, humans are pretuned to use any closely following social situation to regulate their emotional pain. In our *L* treatment, the next social situation following the emotional experience is the letter writing stage, where participants can express their emotions by communicating. In the *W* treatment, the next social situation following the emotional experience is the dictator game, where the same need for emotional expression may be satisfied by giving little to *C*.

Whether it is the emotional closure by Strang and co-authors or the emotional expression by Xiao and Houser, in both cases, negatively charged encrypters are more likely to benefit from letter writing than positively charged raters, which leads to our first hypothesis.

Hypothesis 1. *Letter writing has different effects on participants in a subsequent dictator game: After experiencing unkindness, letter writing leads to higher rates of giving. After experiencing kindness, letter writing does not lead to higher rates of giving.*

When writing a letter, the writer inevitably turns to an audience, the reader. This has two consequences that may affect subsequent decision making. First, as any audience consists of one or several other human beings, writing a letter thus makes the writer aware of the existence of others. Second, to make sure that the writing will be understood by the audience, the writer has to take the reader's perspective.

Neuroscience literature, making use of functional Magnetic Resonance Imaging, shows that under different circumstances, specific regions of the brain become more active. These brain regions then play a greater role in imminent decision making. Several studies describe how both, increased activity in the medial prefrontal cortex, associated with

social situations, especially when other humans are involved in ongoing decision making (Krach et al., 2008), and the temporoparietal junction, associated with perspective-taking (Morishima et al., 2012), may enforce pro-sociality. Just to give some examples, Krach et al. find that participants playing the prisoner’s dilemma, and Rilling et al. (2004) find that participants playing the ultimatum game, produce more cooperative choices when playing with humans instead of computers. Hare et al. (2010) show that brain activity stimulated through a perspective-taking task leads to increases in donations to charity. When in our experiment the writer addresses the boss as his audience, he inevitable engages in perspective-taking. Therefore, letter writing should activate the same brain regions as other social situations, as well as activate brain regions associated with perspective-taking. Knowing that both of these brain regions are associated with pro-sociality, we expect that dictator game decisions taken after letter writing are more pro-social.

Hypothesis 2. *Introducing letter writing has the same effect on participants in a subsequent dictator game: (a) Letter writing leads to higher rates of giving—irrespective of whether subjects were assigned the role of rater or encrypter. (b) The increase in the rates of giving is equally high among encrypters and raters.*

3 Implementation and Descriptive Statistics

The experiment was conducted in May and June 2017 at the Business and Economics Research Laboratory (BaER-Lab) at Paderborn University in Germany. The experiment was programmed using the software z-Tree (Fischbacher, 2007) and participants were recruited with the help of ORSEE (Greiner, 2015). In total, eleven sessions were run, with each session lasting around 45 minutes and earnings averaged at 10.60 €.

3.1 Descriptive Statistics

	boss	encrypter	rater	total
W_0	3	40	40	83
W_M	4	59	59	122
L	4	55	55	114
total	11	154	154	319

Table 1: *Numbers of participants by groups.*

As shown in Table 1, there were 319 participants in total, 114 in the letter writing treatment L and 205 in the waiting time treatment W . As will become clear in the next section, results from W_0 and W_M do not differ, and will be pooled for most of the analysis.

In each session, the boss did choose to assign half of the participants to the encryption task, resulting in a total of 154 observations from encrypters and 154 observations from raters.

	W_0	W_M	L	encrypters	raters
age	23.55	23.09	22.33	22.74	23.10
male	34%	33%	36%	32%	36%
economics major	38%	41%	45%	42%	40%
engineering	8%	7%	7%	7%	8%
cultural science	9%	8%	7%	7%	9%
teaching	40%	41%	36%	40%	39%
initial happiness	5.91	5.58	5.83	5.76	5.75

Table 2: *Demographic statistics by groups.*

Randomization has worked considerably well, as shown in Table 2. In particular, the happiness elicited at the very beginning of the experiment is very similar across treatments.

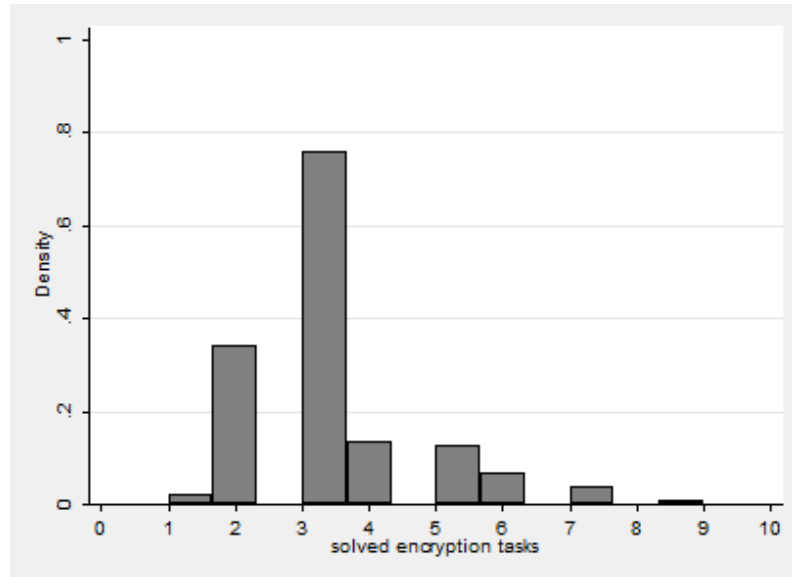


Figure 1: *The figure shows the distribution of correctly solved encryption tasks by encrypters.*

Before actually analyzing the data, there are a couple of design checks. First, we want to see whether all encrypters were actually engaging in their task. Figure 1 shows that while most encrypters solved at least three tasks, hardly any of them succeeded in

finishing seven or more tasks before the end of the stage.⁶ As in each session there was one encrypter assigned to solve 10 encryption tasks, all participants did thus eventually end up waiting for this single person (and a few other, exceptionally slow participants) to reach the assigned target. As a result, every session was terminated by the experimenters after a maximum of three minutes. All treatment phases were thus of equal length.

Second, we want to check whether the manipulation was successful in the sense that it made encrypters relatively more unhappy. Comments from the post-experimental questionnaire suggest that the task was indeed perceived as difficult and annoying, which increased the pressure to finish quickly by solving as many tasks as fast as possible. Answers from the questionnaire also suggest that over time, encrypters started to be increasingly frustrated. In all treatments, initial median happiness was rated 6 out of 10. After the treatment, self-reported happiness is 4 points higher among raters compared to encrypters, with a median of 3 and 7 respectively. Figure 2 illustrates this difference, and running a Mann-Whitney-U test confirms its significance (p-value 0.00). This effect on reported happiness is, in its size, comparable to the effect found by Strang et al. (2016) when receiving an unfairly low rather than a fair share of money. This similarity supports our assumption that the induced unkindness is strong enough to start off a chain.

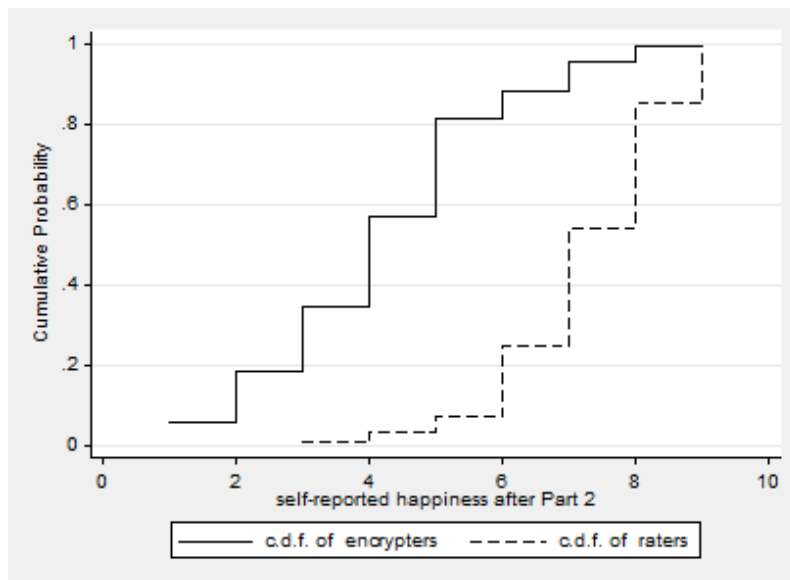


Figure 2: *The probability of reporting a low happiness is lower for raters than for encrypters.*

Finally, we want to know whether encrypters perceived the task assignment as unkindness. Some evidence comes from the content of the letters written by encrypters compared to raters. While participants were free to design the letter as they wanted, most did choose a typical letter format, starting by addressing the recipient, in this case the boss, in formal language as if writing a letter to a stranger. Even informal letters were written as comments or messages directed to the boss. Hence, the overwhelming majority of participants took the letter writing serious.⁷ In the typical encrypter letter (e.g. Appendix Section 7.1), the

⁶The raters did also actively engage in their task. Raters watched between 2 and 8 videos and reported at least one and at most 8 likes.

⁷Only 3 encrypters and 10 raters sent empty letters, meaning that they did write less than one word.

author complains about one or several issues he had while carrying out his task, such as the time pressure, or being interrupted by the boss' message to hurry up. Some explicitly blame the boss for his decision and state that they would rather have done the other task. In the typical rater letter (e.g. Appendix Section 7.2), the author thanks the boss, either for having been assigned to the more pleasant task, or for making the task so enjoyable, thereby often commenting on the videos. Overall, the content of the letters supports the assumption that the boss was actually held responsible for the kind or unkind task assignment.

4 Main Results

First, we find that in line with both hypotheses, encrypters are more generous in the *L* treatment. The whole distribution shifts to higher values of giving, as shown in Figure 3.⁸ On average, the amount passed on to the third person increases by 0.69 € when moving from the *W* to the *L* treatment, which is (albeit weakly) statistically significant (p-value of Mann-Whitney-U test 0.058).

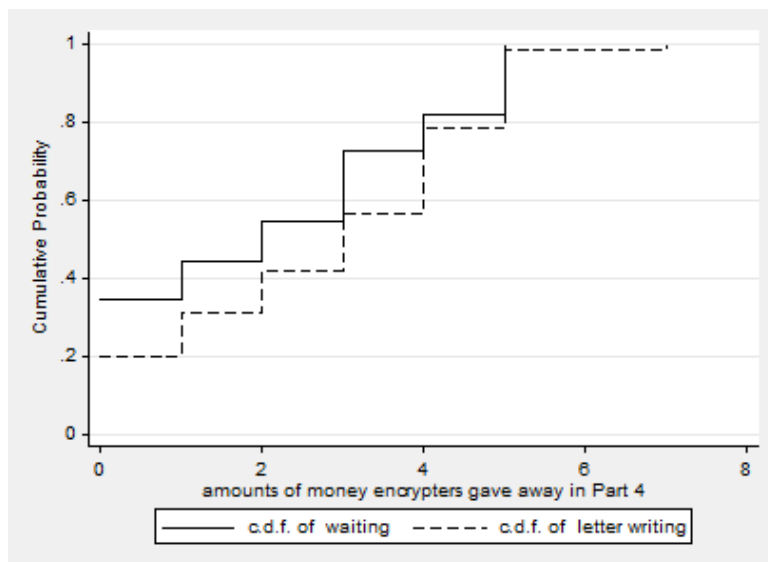


Figure 3: *The willingness to give differs between treatments: Low amounts are less frequent in the L than in the W treatment.*

Second, the distribution of rates of giving by raters also shifts to the right, as shown in Figure 4. The average amount given increases by 0.64 €, which is again weakly significant (p-value of Mann-Whitney-U test 0.0525). This is more in line with Hypothesis 2 rather than Hypothesis 1.

Comparing Figure 3 and 4 shows that the shift in giving among raters is very similar to that of encrypters. To formally test our hypotheses, we compare these differences in the rates of giving across raters and encrypters. As illustrated in Figure 5, the magnitudes of the two effects are very similar, with average increases of 0.69 € versus 0.64 € respectively.

⁸To create Figures 3 and 4, the two control conditions were pooled, after running a Mann-Whitney-U test confirmed that there is no significant difference between the amounts given away by encrypters in W_0 and W_M (p-value 0.39) and raters in W_0 and W_M (0.86) respectively.

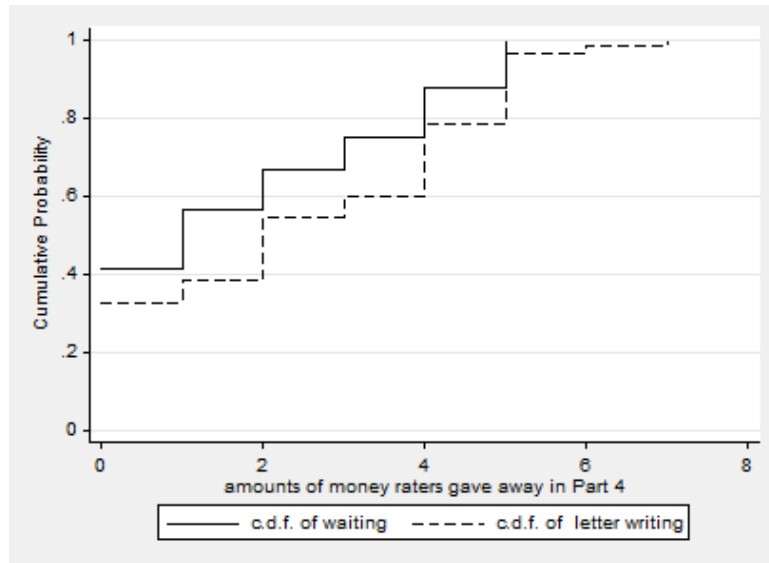


Figure 4: *The willingness to give differs between treatments: Low amounts are less frequent in the L than in the W treatment.*

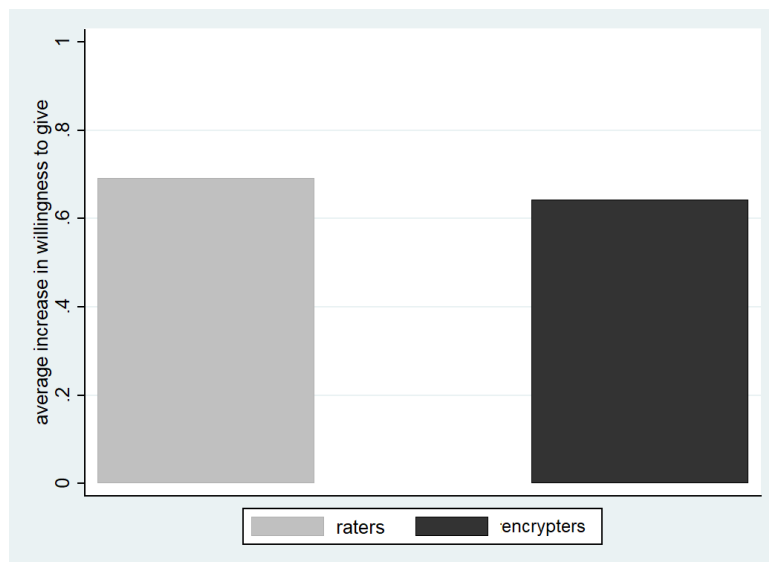


Figure 5: *The average increase in amounts given due to letter writing is similar for raters and encrypters.*

We calculate and compare Cohen's d effect size measures for both effects. Cohen's d for the effect among raters is -0.34 standard deviations and for encrypters is -0.35 standard deviations. This difference between the effect sizes of 0.009 standard deviations, is statistically not significantly different from zero (p-value 0.97).

	Tobit1	Tobit2	Tobit3
letter writing	0.945*** (0.337)	0.942*** (0.335)	0.855* (0.470)
rater		-0.548* (0.323)	-0.613 (0.407)
letter writing x rater			0.177 (0.674)
male	-0.809** (0.347)	-0.784** (0.345)	-0.794** (0.347)
_cons	1.517*** (0.236)	1.783*** (0.280)	1.818*** (0.310)
sigma _cons	2.715*** (0.147)	2.702*** (0.146)	2.701*** (0.146)

$n=308$

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Estimates from Tobit regressions with giving in the dictator game as dependent variable, double-censored and standard errors displayed in parenthesis.

A regression analysis provides further evidence. The first line of Table 3 reveals a highly significant and positive baseline effect of the letter writing treatment on the amount given away by dictators of around 0.90€. The second line shows the baseline effect of the rating task, compared to the encryption task. In one specification, this effect is marginally significant ($p=0.091$), which is an interesting side observation but not related to our hypotheses, that are concerned with whether letter writing affects raters and encrypters differently. In order to address these hypotheses, we turn to the interaction between letter writing treatment and being a rater in the third line. The interaction effect is close to zero and not significant at any conventional level. Hence, we cannot support that the letter writing effect is different for raters compared to encrypters. Summarizing, we reject Hypothesis 2 in favor of Hypothesis 1:

Result 1. *Raters and encrypters are affected similarly by letter writing: they both increase giving to an innocent third person.*

This similarity allows us to pool the data obtained from raters and encrypters, in order to more precisely estimate the general increase in giving caused by letter writing. This

general effect of letter writing is an average increase in giving of 0.67 € (or 35%), which is highly significant (p-value of Mann-Whitney-U test below 0.01). Figure 6 shows how the overall distribution of giving shifts to the right.

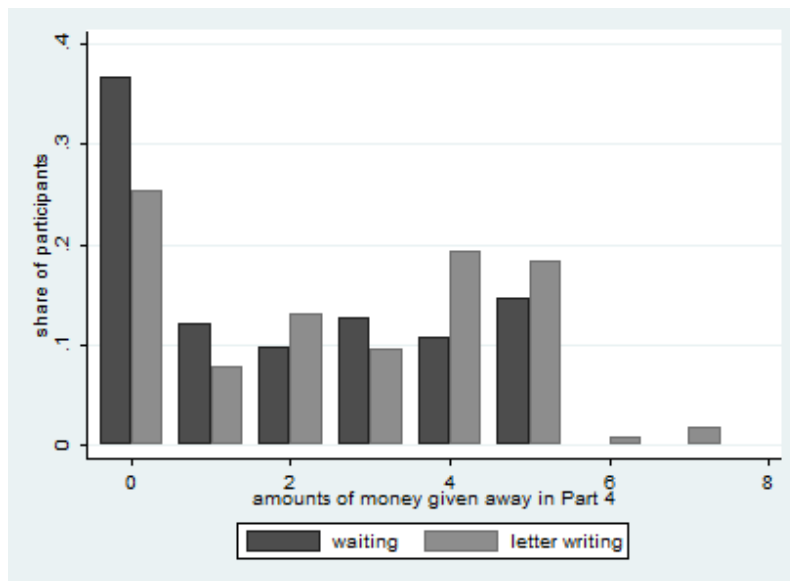


Figure 6: *Subjects in the L, rather than W treatment give more to an innocent third person.*

After having had the opportunity to write a letter, the distribution of amounts given by raters and encryters is not only increased, but it also looks strikingly similar, as becomes evident when comparing the dashed lines in Figures 3 and 4. Indeed, there is no significant difference between these two distributions (Kolmogoroff-Smirnov test p-value: 0.98). At first glance, this may suggest that letter writing successfully interrupts a chain of unkindness. For this interpretation, however, we have to establish that there has been a chain of unkindness in the first place. We will turn to this issue in the following section.

5 Incidental Results

After having established the main result, this section describes additional incidental findings related to our topic of research and based on the experimental data we collected. First, we describe the effect of gender on our outcome variable. Second, we revisit the question whether our data support the existence of a chain of unkindness that arose at the end of Section 4.

Gender effect

In our regression, being male has a significant negative effect on the willingness to give, as shown in the fourth line of Table 3. This is in accordance with previous literature on dictator games (Engel, 2011). Across all specifications, we find that males give away between 0.784 € and 0.809 € less than females. While this is an interesting finding for

itself, it also stresses the importance of controlling for gender when estimating effect sizes, and underlines the robustness of our results.

Chains of unkindness

For evidence of the existence of a chain of unkindness, we turn to the W treatment, where subject's choices to give are not affected by the opportunity to write a letter. In this treatment, given that chains of unkindness exist, encrypters should give less than raters, because they have been treated unkindly. The cumulative distributions of amounts given by raters and encrypters, however, seem very similar—compare solid lines in Figures 3 and 4. Testing for a difference using a Kolmogoroff-Smirnoff test reveals that these two distributions are also statistically not different from each other (p-value 0.99). If anything, raters, rather than encrypters, are less willing to give away money. This negative effect of being a rater is confirmed in our regression analysis. The second column of Table 3 reveals a negative, though only marginally significant effect of 0.548 € of being a rater on the willingness to give.

Result 2. *Raters are not passing on more to an innocent third person than encrypters.*

Recall that both groups do significantly differ in their happiness. Subjects seem to be capable to mentally separate what they have been exposed to by the boss from what they are giving to the third person. There is no chain of unkindness in our data and subjects do not need to be stopped from paying it forward. As our results do not provide evidence in support of the chain of unkindness, we turn to differences between our and other studies that might explain this. Compared to Strang et al. (2016), our setup differs firstly because their study only uses observations from female participants and secondly because unkindness is induced by a dictator game.

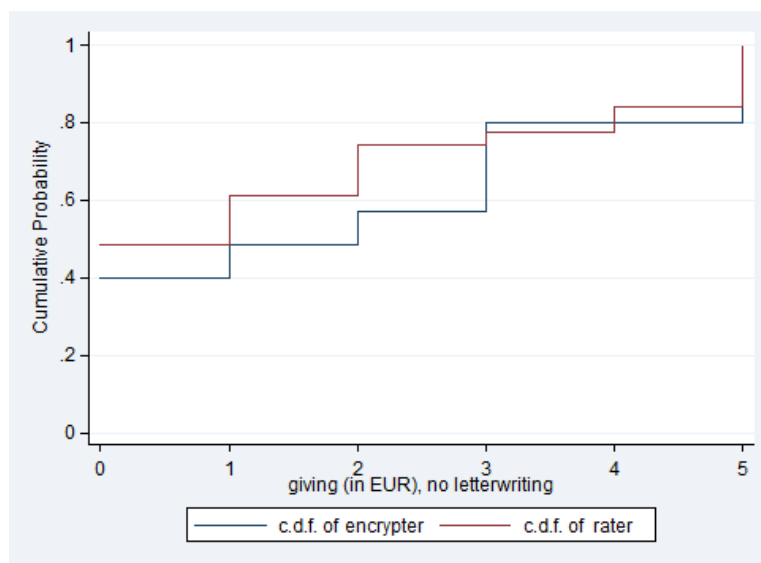


Figure 7: *The willingness to give does not depend on which task preceded the dictator game: There is no significant difference between the amounts given by raters and encrypters.*

First, we restrict our sample to only female subjects to make it more comparable. Still, we do not find evidence that encrypters give less than raters (Kolmogoroff-Smirnov test p-value: 0.89), as illustrated in Figure 7.

Second, we revisit the way we induce unkindness. A necessary condition for a chain of unkindness is that participants *B* are actually affected unkindly by going through the encryption task to start off the chain. A possible limitation of our study may be that the induction of unkindness is not strong enough. However, the induction of unkindness does significantly decrease elicited happiness, as described in Section 3 and illustrated in Figure 2. Median happiness among encrypters drops from 6 to 4 (p-value <0.001 Mann-Whitney-U test), and is thus dropping by as much as in the experiment by Strang and co-authors, where the unkind experience consisted in receiving 5 € out of 25 €, instead of 12.50 € out of 25 € from a previous dictator.

While it is clear from the present results that we do not find a chain of unkindness, it remains unclear whether there actually is a chain of unkindness in the experimental setting by Strang et al. (2016). Their study does not have enough kindly treated subjects for a statistical analysis in order to see whether these behave differently from unkindly treated subjects.

6 Conclusion

Analyzing data from a laboratory experiment, we investigate whether writing a letter helps with regulating emotions or whether it has a general pro-social effect. We find that letter writing leads to increased rates of giving irrespective of whether subjects experienced an annoying or enjoyable task beforehand. This result is especially remarkable since people do report to be in very different moods before writing the letter, which is also reflected in the content of the letters. Even the magnitudes by which giving increases, are very similar for the subjects who previously experienced unkindness and kindness. This suggests, that letter writing may activate more social modes of thinking in the sense of stimulating caring for innocent others in general. For further confirmation of the explanation behind this hypothesis, future research could make use of functional Magnetic Resonance Imaging. This would allow to see whether letter writing activates regions of the brain that are typically associated with social activities. Our result suggests that letter writing can promote selfless behavior.

As a side-result, we cannot support the presence of a ‘chain of unkindness’ with our data. It may be that chains do not continue when changing the decision situation. While experiencing kind and unkind behavior has opposing effects on participants’ self-reported happiness, they do not act upon it. Instead, they give equal amounts to a third party in a subsequent dictator game.

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7 Appendix

To give the reader an impression of how the letters written by raters and encrypters in the *L* treatment look like, two representative letters are displayed below.

7.1 Letter from encrypter

Sehr geehrter Herr/ Frau

hiermit möchte ich sie bitten, den Übersetzern doch bitte mehr Zeit bei ihrer Arbeit zu geben, da dies unter ihren Bedingungen kein effizientes Arbeiten darstellt. Zudem sind die anderen Arbeiter mit ihrer Nebenbeschäftigung, dem Videos gucken, ziemlich laut, sodass dies das Übersetzen noch schwieriger gestaltet.

Mit freundlichen Grüßen

7.2 Letter from rater

Sehr geehrter Herr Boss,

ich möchte die Möglichkeit nutzen, Ihnen persönlich für diese angenehme Arbeitsatmosphäre zu danken. Die Videos sind überwiegend lustig.

Ihr zufriedener Mitarbeiter