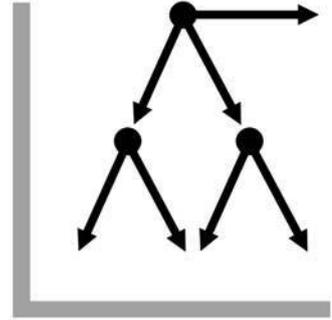


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Why letter writing leads to kindness: Regulating emotions or activating pro-social thinking?

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When letter writing leads to 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 in order to regulate emotions by ‘closing the case’. 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. However, we propose a second possible 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. Incidentally, our subjects do not pass on unkind behavior.

Keywords: pro-sociality, chain of unkindness, letter writing, laboratory experiment

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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 uncooperative, unproductive, or inefficient behavior within their organizations.

Recently, Strang et al. (2016) have suggested a remedy against such chains of unkindness: subjects in the role of the unkindly treated person *B*, who wrote a letter to the unkind person *A*, pass on significantly more money to an innocent third persons *C* in a subsequent dictator game relative to those subjects who were not given the option to write a letter. Strang et al. argue that the reason might be that writing a letter helps person *B* to emotionally ‘close the case’. Recent evidence, however, raises doubts about this explanation. If it were true, writing letters should affect the mood of subjects in the role of *B* more positively than waiting. Schnedler and Stephan (2018), however, find that self reported happiness by subjects who write letters is affected equally to happiness reported by those who wait.

In the present paper, we consider an alternative explanation for the effect of letter writing: 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. Being given the opportunity to write a letter might thus 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 than on 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 how much money is being passed on to the innocent third party. This is consistent with the explanation that letter writing activates pro-social modes of thinking rather than the ‘closing the case’ explanation.

In addition to this central result, 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 to the other subjects (in the role of *B*) a pleasant or unpleasant task. The pleasant task consists in watching and rating a series of funny video clips, while the unpleasant task involves encrypting meaningless codes. After finishing

¹Studies 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.

their respective tasks, some subjects, our *treatment group* "L", are given the opportunity to write a letter to *A*, while others have to wait. Finally, subjects become dictators in a dictator game, where they decide whether to pass on some money to an innocent person (*C*), who is not taking part in the present experiment. A detailed description of the experimental design follows in Chapter 2.

Our design involves a sequence of three players, similar to experiments on third-party punishment (see, 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. By also using the dictator game, 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. There are even studies that take the role of emotions into account. 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) find that letting subjects *B* write a letter to *A* reduces their willingness to punish *A*. In contrast, we want to know how writing a letter to *A* affects *B*'s decision to share money with a third person (*C*). In Xiao and Houser (2009), the authors 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 but cheaper form of sanctioning. Whereas Xiao and Houser (2009) investigate how a dictator's decision is affected by the prospect of receiving a letter, our experiment investigates how a dictator's decision is affected by writing a letter to someone who has previously been kind or unkind to them. Concluding, the present paper builds on this existing research on the effect of letter writing by exploring its effect on yet another unfavorable outcome: the passing on of unkind behavior to an innocent third party.

Our experimental set-up fits and is inspired by the literature on the chain of unkindness, or kindness, which studies whether negatively or positively affected people pass this kind or unkind behavior on to an independent third party—a phenomenon sometimes 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 who receive a sticker from another child are more likely to give away a sticker to a third child. Other experiments investigate chains of unkindness in monetary terms and show that subjects behave more non-cooperatively after a non-cooperative experience (Rankin and Taborsky, 2009) and 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 directly relate to the question why letter writing interrupts such a chain of unkindness.

Our paper most directly relates to Strang et al., 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 to be able to study and compare the effect of letter writing on both, kindly and unkindly treated subjects. This new experimental set-up allows 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 Chapter 2 and an overview of the implementation and descriptive statistics in Chapter 3, Chapter 4 summarizes the main results. Chapter 5 presents additional, incidental results, followed by a conclusion in Chapter 6.

2 Experimental Design

The experiment consists of three treatment conditions: the letter writing treatment and two control conditions. 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 annoying tasks to others. In Part 2, some subjects are exposed to this task and others not in order to induce kindly and unkindly treated subjects. In Part 3, we apply the treatment, i.e., whether subjects have the opportunity to write a letter or not, while in Part 4, we measure whether kindness toward the innocent person.

Part 1: Assignment to roles and tasks

In order to induce kind and 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*), who decides whether to be kind to some and unkind to other participants. To make sure that participants hold the boss, and not the experimenter, responsible for their experience, the boss has the option to be equally kind to all participants. For the same reason, the boss is made responsible for deciding to which half of the participants he will be kind and unkind respectively.

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. 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 an additional 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 encryters and kind to those who become 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 did like 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 random combinations of letters. Second, encryters 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 because of the boss' decision. Third, the work of the encryters is interrupted by annoying reminders from the boss, telling them to hurry up. These reminders appear on the encryters' 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, encryters 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 encryter 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 bring home the point of unfair treatment of the two players, they receive 'feedback' on their and their partners performance. This includes information on how many videos were liked by the rater, and how often the encryter was interrupted by the boss.

Part 3: Treatments *L* and *W*

Next, participants go through the treatment stage, where we implement the intervention (letter writing) necessary to answer our research question. In the treatment group "*L*" (letter writing), it consists of a stage where all participants *X* and *Y* are given the chance to write a letter to the boss (*A*). To make sure that participants write real letters, these are printed and handed out to the boss at the end of the experiment.

In order to learn how participants would behave, were they not given the chance to write a letter, a control group is designed. In the control group, participants do not write letters. To ensure that control and treatment group only differ in the task, and not in length, participants in the control group will spend time waiting " W_0 ", while others write letters.

There is one variant of the control group, designed to help participants mentally account for their experience of being treated kindly or unkindly. Participants are asked questions that help them assess the monetary value they would assign to going through the activity they just experienced in Part 2. This variant of the control group is referred to as " W_M " (waiting and monetization). Both variants W_0 and W_M taken together are referred to as " W ".

Part 4: Dictator game

In the last part of the experiment, in order to measure whether participants pass on unkind or kind behavior, participants play a dictator game. To make sure that participants actually decide to be kind or unkind, and are not just imitating a choice previously made by someone else, kind or unkind action is observed in a dictator game, and not by observing the decision to assign an either kind or unkind task (as was the case for the boss). Moreover, the dictator game leads to outcomes that are easily comparable both across treatments, and across groups of participants treated kindly and unkindly. As a convenient side effect, designing this last part of the experiment as a dictator game allows rating the participants' actions as more or less kind in the same way as done in previous studies such as Strang et al. (2016); Gray et al. (2014); Ben-Ner et al. (2004). Just as done in these previous studies, each dictator receives 10 € and is asked to leave either 0, 1, 2, etc. or up to 10 € 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.

2.2 Elicitation of Happiness

To shed light on potential motives behind participants' choices, we elicit the 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). In between the different stages of the experiments, all participants are asked to describe 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 respective treatment condition, and fourth, after the dictator game.

2.3 Hypotheses

Letter writing can help regulating emotions. There are two ways how this may work. First, Xiao and Houser (2005) 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 opportunity to express their emotion, and do so through an action, if a way to express them by communication is not available. Second, Strang et al. 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 would be 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 regulate emotional pain in any closely following social situation. In our treatment group, the next social situation following the emotional experience is the letter writing stage, where participants can express their emotions by communicating. In the control group, the next social situation following the emotional experience is the dictator game, where the same need is satisfied by giving little to C.

Whether it is the emotional closure by Strang et al. or the emotional expression by Xiao and Houser, in both cases, unkindly treated subjects are more likely to benefit from letter writing than positively charged subjects, which leads to our first hypothesis:

***HA:** 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, both produce more cooperative choices when playing with humans instead of computers. Hare et al. (2010) show that brain activity stimulated through a perspective-taking tasks leads to increases in donations to charity. When in our experiment the writer addresses the boss as his audience, he is inevitably reminded of the presence of the boss. As out of the people present during the experiment, the boss is the only one who is in some way relevant for the writer's current situation, he is thus reminded not just of some human presence, but of the presence of the one relevant human. Moreover, by addressing the boss, the writer 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 strengthen pro-sociality, we expect that dictator game decisions taken immediately after writing the letter also result more pro-social.

Hence, neuroscientific research suggests that awareness of a social context, as well as perspective-taking, increase pro-sociality in general. At the same time, this research does not provide a reason to assume that the increase in pro-sociality is conditional on some specific previous experience or emotional history. This leads to our second hypothesis:

H0: Introducing letter writing has the same effect on participants in a subsequent dictator game: (a) After experiencing either unkindness or kindness, letter writing leads to higher rates of giving. (b) The increase in the rates of giving is equally high among those who previously experienced unkindness and kindness.

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	encryptor	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.*

In total, there were 319 participants, 114 in the letter writing treatment L and 205 in the waiting time treatment W (83 of those were in the W_0 and 122 in the W_M condition)—see Table 1. 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, leading to a total of 154 observations from encryptors 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—see Table 2. In particular, the happiness elicited at the very beginning of the experiment is very similar across treatments.

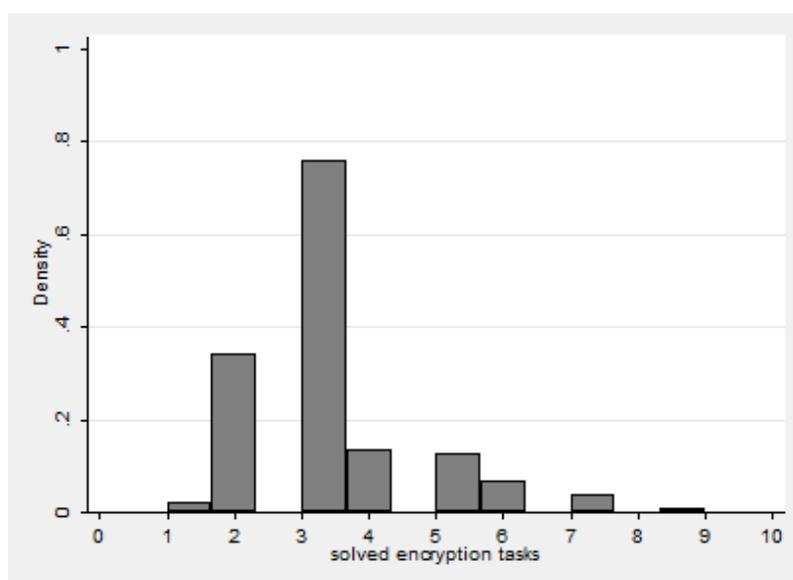


Figure 1: The figure shows the distribution of correctly solved encryption tasks by encrypters during Part 2 of the experiment.

First, we want to confirm whether the subjects in the role of encrypters engaged in their assigned task. All encrypters did actively engage in solving at least some of the encryption tasks, with a median of three correctly solved tasks. Figure 1 shows that while most encrypters solved at least three tasks, hardly any encrypter solved seven or more tasks before the end of the stage. As in each session there was one encrypter assigned to solve 10 encryption tasks, and thus all participants would eventually end up waiting for this one

participants (and a handful of other, exceptionally slow participants) every session ended up being terminated by the experimenters after a maximum of three minutes.

Second, we want to check whether the manipulation was successful in the sense that it made encrypters unhappy. Comments from the post-experimental questionnaire suggest that the task was indeed perceived as difficult and annoying, which increased the pressure to quickly finish by solving as many tasks as quickly 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 Part 2, 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 of receiving an unfairly low, rather than a fair share of money, as in Strang et al. (2016). This similarity gives us reason to believe that the way we inducted unkindness to be strong enough to start off a chain of unkindness.

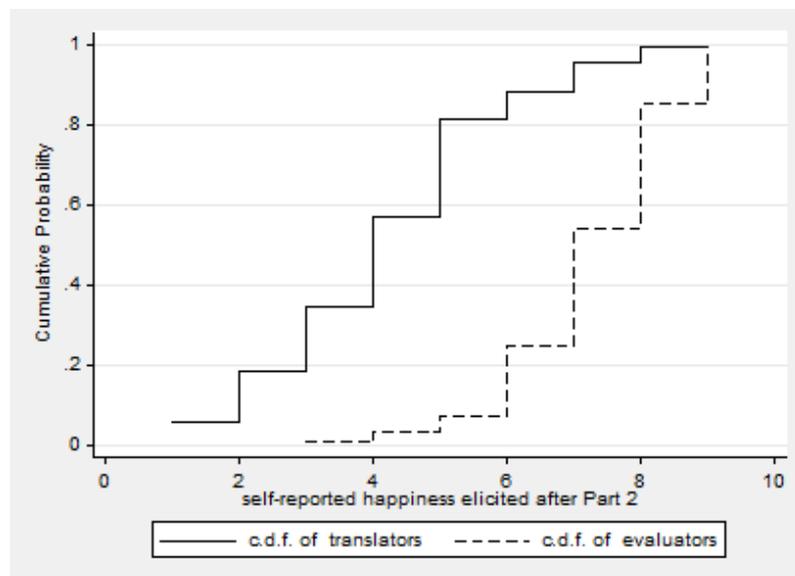


Figure 2: The figure displays cumulative distribution functions of participants' self-reported happiness elicited right after the rater or encrypter task respectively. Instantaneous happiness among encrypters is clearly lower than among raters.

Finally, we want to know whether the task assignment was perceived as unkind by the encrypters. Some evidence comes from looking at the content of the letters written by participants in the role of *B* to participants in the role of *A* during Part 3 of the experiment. While participants *B* 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, and mostly choosing a formal form of address and language, typical for letters written to strangers. In the typical encrypter letter, the 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. In the typical rater letter, the author thanks the boss for having been assigned to the more pleasant task and comments 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. A typical letter written by an encrypter and a rater is displayed in the appendix.

4 Main Results

We find that in line with both hypotheses, unkindly treated subjects (encrypters) are more generous in the letter writing treatment. The whole distribution shifts to higher values of giving—see Figure 3.² On average, the amount passed on to the third person increases by 0.69€ when moving from the waiting to the letter writing treatment, which is (albeit weakly) statistically significant (p-value of Mann-Whitney-U test 0.058).

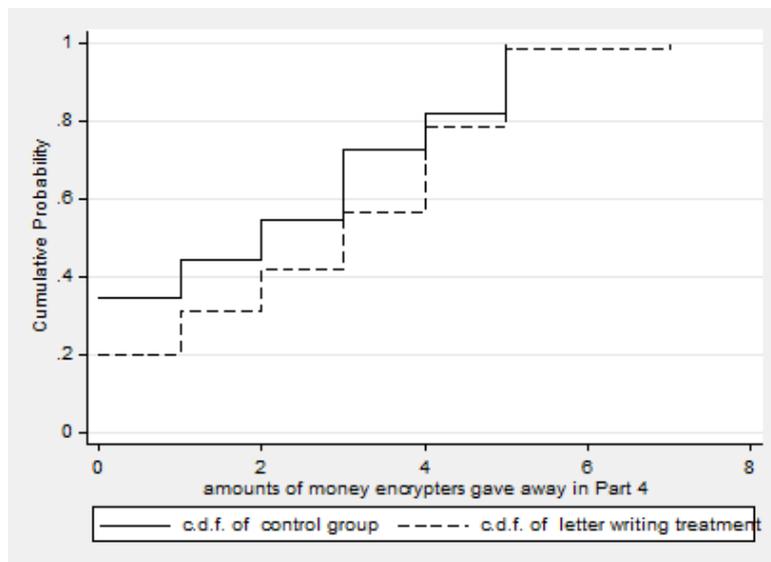


Figure 3: Cumulative distribution function of amounts given by encrypters. The willingness to give is higher when letters are written: Low amounts are less frequent in the L than in the W treatment.

Second, the distribution of rates of giving by kindly treated subjects (raters) also shifts to the right—see Figure 4. The average amount given increases by 0.64€, which again is weakly significant (p-value of Mann-Whitney-U test 0.0525). This is in line with Hypothesis 0 and not in line with Hypothesis A.

The shift in giving among raters is very similar to that experienced among encrypters, which can be seen by comparing Figure 3 and 4. To formally test our hypotheses, we compare the difference in the rates of giving between the *L* and *W* treatment for 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.

To be even more precise, we calculate Cohen’s *d* effect size measures for both effects in order to compare them in more detail. Cohen’s *d* for the effect among raters is -0.34 standard deviations and among encrypters is -0.35 standard deviations. This difference between the effect sizes of 0.009 standard deviations, is statistically not significantly

²To 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.

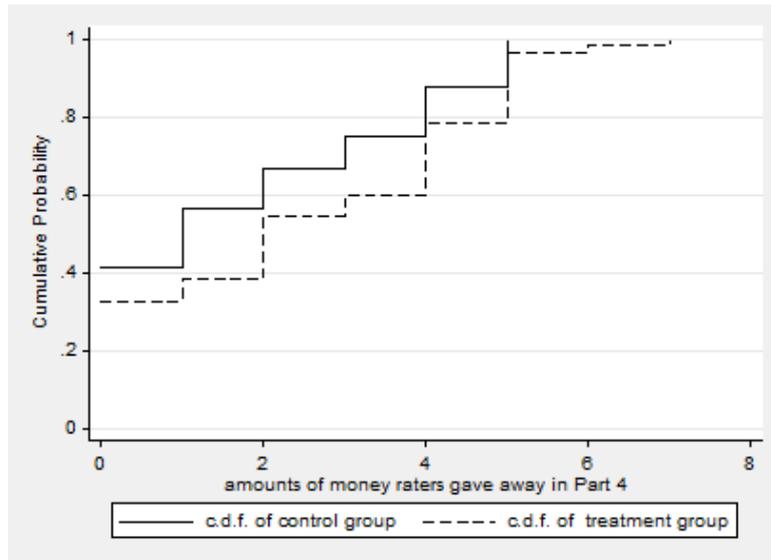


Figure 4: Cumulative distribution functions of amounts given away by raters. The willingness to give is higher when letters are written: Low amounts are less frequent in the L than in the W treatment.

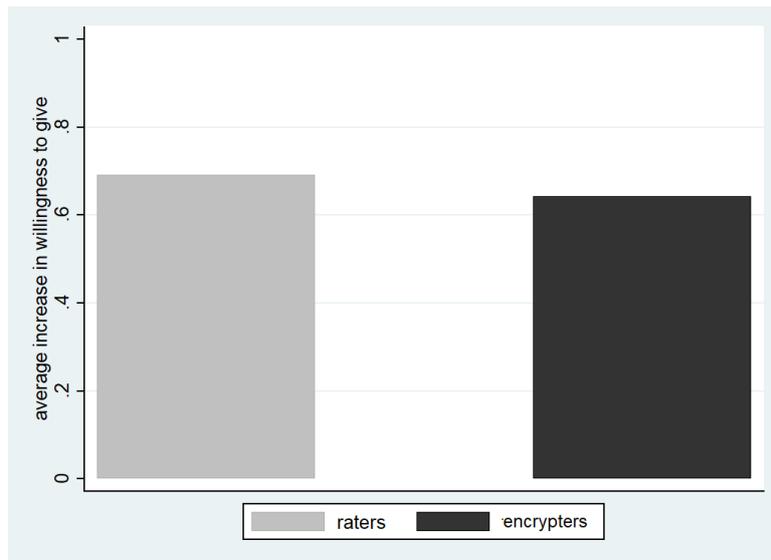


Figure 5: The average increase in amounts given due to letter writing is similar for raters and encrypters.

different from zero (p-value 0.97). Hence, we can reject Hypothesis H_0 in favor of Hypothesis H_A , and summarize our central result as follows:

Result 1. *Subjects who are treated kindly (raters) and unkindly (encrypters) are affected similarly by letter writing: they both increase giving to an innocent third person.*

The similarity allows us to pool the data obtained from raters and encrypters, in order to more precisely estimate the general increase caused by letter writing. This general effect of letter writing is an average increase 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.

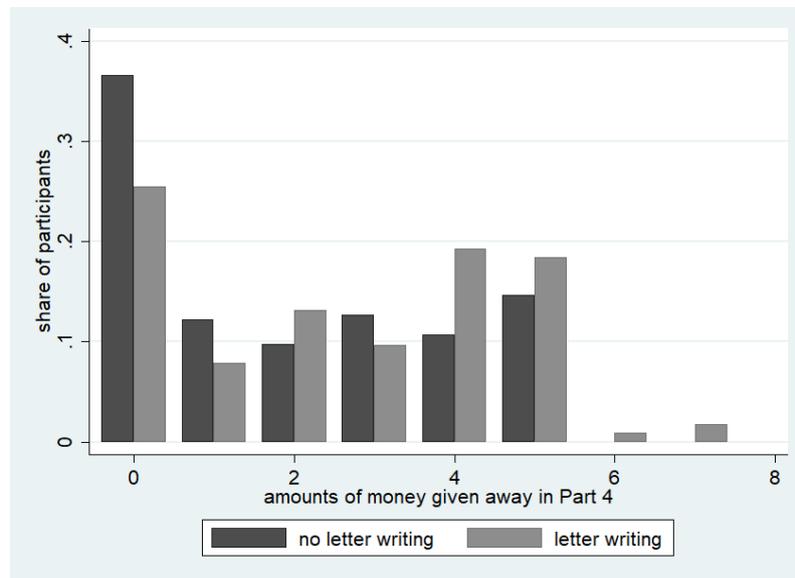


Figure 6: *Subjects in the L treatment give more to an innocent third person.*

After having had the opportunity to write a letter, the distribution of amounts given by raters and encrypters is not only increased, but also strikingly similar—compare dashed lines in Figures 3 and 4. Indeed, there is no significant difference (p-value Kolmogoroff-Smirnov test: 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 chapter.

5 Incidental Result

To establish the existence of a chain of unkindness, we should find that in the *W* treatment, rates of giving are indeed smaller among encrypters.

The cumulative distributions of amounts given by raters and encrypters that had no opportunity to write a letter, however, appear 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, encrypters are slightly more likely to give compared to raters.

Result 2. *Subjects who are treated kindly (raters) are not passing on more to an innocent third person than subjects who are treated unkindly (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 wonder whether other experimental studies that do find support for the chain of unkindness differ in some substantial way. Strang et al. (2016), for example, focus only on female participants. Restricting our sample only to female subjects, however, we still find no evidence that encrypters give less than raters (p-value of Kolmogoroff-Smirnov test: 0.89), as illustrated in Figure 7.

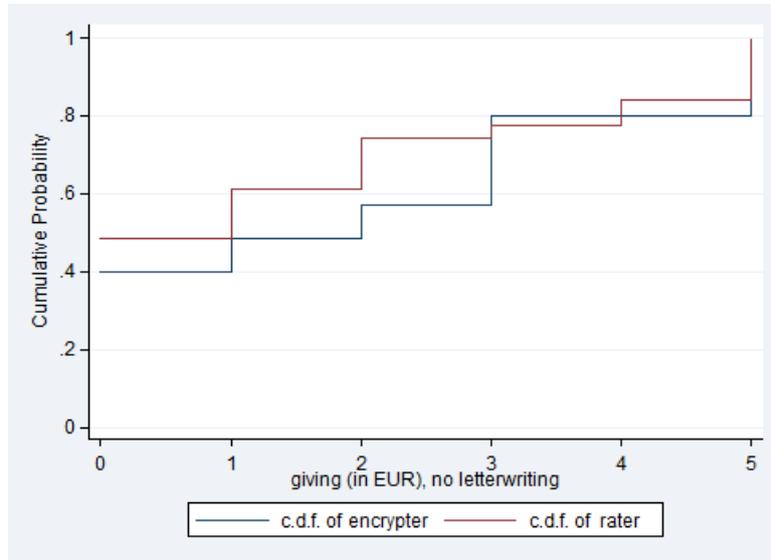


Figure 7: The figure displays cumulative distribution functions of amounts given away by female raters and female encrypters in Part 4 of the experiment. There is no significant difference between the amounts (p-value of Kolmogoroff-Smirnov test: 0.89).

What other than gender could explain the contrast to the existing literature? Of course, 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. It might be a limitation of our study, that the induction of unkindness has not been strong enough. However, the induction of unkindness did significantly decrease elicited happiness, as described in section 3 and illustrated in Figure 2, with median happiness among encrypters dropping from 6 to 4 (p-value <0.001 Mann-Whitney-U test), and thus dropping by as much as in the experiment by Strang et al. (2016), 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 is a question open to be answered by future research, whether there would have been a chain of unkindness in the experimental setting by Strang et al. (2016); the authors only gathered a handful of observations from kindly treated people, which are not sufficient for testing Hypothesis *H0*. There is, of course, an existing literature on paying it forward, as described in Section 1. However, to the best of our knowledge, all existing literature is restricted to observing whether subjects pay it forward within the same domain (be it monetary or non-monetary). Hence, in all of these cases what may be at work is that people simply imitate a recently observed choice and would not pay it forward in another domain either. Future research is needed to re-investigate the chain of unkindness and confirm its existence across domains, or to find evidence for an alternative explanation.

6 Conclusion

Analyzing data from a laboratory experiment, we investigate whether writing a letter helps with emotional control or has a general pro-social effect. We find that letter writing leads to increased rates of giving in a dictator game for people that have undergone very different tasks prior to the letter writing. 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, among those who previously experienced kindness and unkindness respectively, are very similar. This suggests, that letter writing may activate more social modes of thinking, and hence increase 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 in order to test whether letter writing activates regions of the brain that are typically associated with social activities.

As a side-result, our data raise doubt about a common interpretation of ‘chains of unkindness’. 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. The previous literature focuses on chain of unkindness where one specific decision situation is repeated in the chain. This could suggest that established chains of unkindness may actually be driven by imitation rather than ‘paying it forward’. Future research could provide further evidence whether unkindness is indeed paid forward by employing a cross-domain result similar to ours. It is, of course, also possible that the induction of unkindness (kindness) is simply not strong enough to make participants act upon it. Still, we would be surprised if the overall pro-social effect of letter writing should not be confirmed by future experiments. Therefore, we suggest that future research should test the effect of letter writing in settings with even stronger inductions of unkindness, for example, in the field.

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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.

[2ex] Ihr zufriedener Mitarbeiter