

Are Wikipedia Users Conditionally Cooperative? Evidence from Fundraising Trials*

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October 28, 2020

Abstract

We analyze a series of trials that randomly assigned Wikipedia users to different web banners that solicit donations. The trials systematically manipulated the text of the banners. In the spirit of norm nudging, the trials varied social information about how many other users are donating. The results suggest that the nudge fails. Treatments that indicate higher numbers of donors or higher donation rates do not induce conditionally pro-social conduct. In fact, a trial that framed an identical number of donors as “few” instead of “many” significantly increased users’ propensity to donate. We discuss several possible explanations for our findings.

JEL Classification: C93, D91, Z13

Keywords: Donations; social information; norm nudging

*This project would not have been possible without the cooperation of Wikimedia Germany. We would like to thank Till Mletzko and Tobias Schumann for their patient support as well as Eugen Dimant and Egon Tripodi for their constructive comments. Financial support from the Thyssen Foundation is gratefully acknowledged.

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1 Introduction

Conditional cooperation is a well-documented empirical regularity (Fischbacher et al., 2001; Gächter, 2007): for a non-trivial share of individuals, the inclination to act pro-socially depends positively on the cooperation of relevant others. The provision of social information or cues about the behavior of relevant others – descriptive norm nudging – can therefore influence pro-social conduct.

Consistent with this notion, numerous studies on charitable giving document conditionally cooperative donation behavior. Most of the evidence comes from trials that vary information about the amount relevant others give (e.g. Alpizar et al., 2008; Shang and Croson, 2009). Communicating a higher donation value typically triggers a positive effect on the donated amount.¹ Studies that vary information on the absolute number or the rate of donors are rare. The most well known is Frey and Meier (2004), who experiment in a student population, stressing that either 46% or 64% of other students have contributed to charitable funds in the past. The authors report a positive, but statistically insignificant treatment effect on donation rates. The effect only becomes significant after conditioning on students' past donations. Despite this limited evidence on the benefits of providing extensive margin social information, many practitioners seem to view norm nudging as a universally successful policy tool to raise donation rates and, more generally, induce behavior change. This paper challenges this view.

We present the results from a series of trials run as part of Wikipedia's online fundraising campaigns. While reading entries in the worldwide largest online encyclopedia, a banner may pop-up at the top of a user's browser window. The texts of these banners, which all solicit donations, present direct or indirect social information about other users' propensity to donate. Wikimedia Germany (henceforth WMDE), which operates the German language website of Wikipedia, shared with us data on all trials that systematically varied social information regarding donations at the extensive margin. In addition, WMDE also allowed us to implement a preregistered trial that closely followed Frey and Meier (2004).

In total, we analyze six trials that produced nearly 23,000 donations, summing up to 442,167 Euro. All trials used a control banner that points to a low absolute number or a low rate of donations. Treatment banners varied minor text parts pointing to higher numbers or higher donation rates. If Wikipedia users acted conditionally cooperative, one would expect positive treatment effects. The results reject this hypothesis. In five out of six trials, we find negative or null results: donations over banner impressions (i.e. donation rates) decline or remain constant. Only one trial yielded a statistically insignificant positive effect on donation rates. At the intensive margin, treatments had no effects.

¹These positive intensive margin effects tend to be negatively associated with extensive margin responses: pushing up the average donation tends to reduce the number of donors. The literature has also identified clear limits to donation levels that are perceived as relevant social information (Croson and Shang, 2013). In terms of underlying mechanism, one has to further note that any communicated donation values may also serve as anchors.

We discuss several explanations why the experimental variation in social information failed to evoke conditionally cooperative donation behavior. Note first that, while all treatment banners try to convey a stronger pro-social norm to donate than control banners, the information points to relatively low donation rates. The communicated numbers might therefore be perceived as incongruous with the implicit normative expectation (Bicchieri and Xiao, 2009). One might further argue that a single user does not feel socially close to the large and abstract pool of all Wiki users (Goette and Tripodi, 2019). Hence, the social information may – in a potentially self-serving way – not be seen as relevant for the behavior in ones’ reference group of peers (Bicchieri et al., 2020). This pattern could also give rise to “stickiness” of users’ beliefs (Falk and Zimmermann, 2018) about the conduct of relevant others and the perceived social norm.

Note further that Wikipedia users are typically familiar with the quality of the online encyclopedia. Hence, the information about others’ donation behavior cannot provide a signal about the quality of the public good (Vesterlund, 2003; Potters et al., 2007). The absence of this channel again works towards a null result. Finally, one might argue that the self-identity return from donating is in fact larger if relatively few others are donating (i.e. if users perceive the own donation as more important in maintaining Wikipedia). In that case, information on only few others acting pro-socially may *increase* the self-image value associated with a donation (e.g. Bénabou and Tirole, 2006, 2011). This channel could therefore explain why several trials document negative treatment effects.

While our setting does not allow us to discriminate among these different explanations, the evidence challenges the widely held view that providing social information is a panacea.² In this vein, we contribute to the growing body of evidence from the lab (e.g. Bicchieri and Dimant, 2019) and the field (e.g., Cantoni et al., 2019; Fellner et al., 2013) that documents the limits of social norm nudging and belief management strategies.

Our paper also contributes to the literature on charitable giving (List, 2011). Beyond Frey and Meier (2004), this literature has mainly focused on variation in social information on donation amounts (which may also serve as anchors) rather than information on others’ overall inclination to donate.³ We explore a unique set of randomized trials that vary, within a given and well known context, direct or indirect information about the number of donors or about donation rates. Our results show that such information strategies fail to induce conditionally cooperative donation behavior among Wikipedia users.

The remainder of this paper is structured as follows. Section 2 discusses the different trials and our data. Section 3 presents the results. Section 4 concludes.

²For recent contributions that isolate alternative channels shaping the success or failure of social information strategies see Goette and Tripodi (2019) and Bicchieri et al. (2020).

³Non-experimental evidence from pre/post variation in ‘extensive margin’ information is discussed in Heldt (2005). An interesting and closely related study is Martin and Randal (2008), who jointly vary cues about donation amounts as well as the number of donors.

2 Trials and Data

We study Wikipedia user’s decision to donate after being exposed to a donation banner (see Appendix Figure A1). During WMDE’s trialing and fundraising period, a donation banner may slide down from the top of a user’s browser window. A click on the banner opens another website that asks users to enter their payment details and to confirm the donation amount. WMDE provided us with data that track banner impressions and information on (completed) donations. Beyond this information Wikipedia stores – differently from most other players in big tech – basically no data on their users.

Our analysis explores all randomized trials conducted by WMDE that systematically varied social information or (indirect) cues about the donation frequency of all other users. In addition, we designed, pre-registered and implemented our own trial.⁴ All trials tested a baseline banner (“control”) against a variation (“treatment”) that changed the banner text without affecting the size of the banner. Table 1 provides an overview of the six trials that we analyze. The trials, which were conducted between 2014 and 2018, vary in scale, ranging from 1.2 to 6.6 million total impressions per trial. In total, the six trials cover nearly 23,000 donations that sum up to 442,167 Euro.

The first two trials test framing effects in the communication of a given piece of social information. The manipulations only affect one sentence of the banner text that compares numbers of donors and impressions. More specifically, trials 1 and 2 varied the framing of the (given) number of donors, referring to the number in a negative (“...but only N people donated ...”) or positive manner (“already N people donated ...”; see Table 1).

Trials 3 and 4 follow a similar logic. Both trials alter the same sentence that communicates a given number of donors relative to a larger or a smaller baseline: the cumulative total number (control) or the average daily number (treatment) of banner impressions in millions. Thus, the same number of donors should appear larger in the treatment conditions: the numbers imply donor-to-impression ratios that are 20 (trial 3) or 40 times (trial 4) larger than those from the control conditions.

The last two trials directly vary social information. Trial 5 communicates the number of world-wide Wikipedia users and notes that “less than 0.1%” (control) or “less than 1%” (treatment) donate. Trial 6, which we designed in cooperation with WMDE, closely follows the spirit of Frey and Meier (2004) in communicating a lower and a higher number of donors: the control banner notes that 359.000 users donated last year; the treatment highlights an average of “more than 400.000” annual donors “over the last years”. Both pieces of information are truthful.

All trials provide direct or indirect cues about other users having either a relatively low (control) or relatively high propensity to donate (treatment). If Wikipedia users in Germany act conditionally cooperative, we should therefore observe positive effects from the descriptive social norm nudges: the rate of donations should be higher in the treatment as compared to the control group banners.

⁴See [AEA RCT Registry ID 3543](#) (November, 2018).

Note further that all trials varied signals about the absolute number of donors or their share (relative to a baseline) rather than information about the donated amount (as in, e.g., [Alpizar et al., 2008](#); [Shang and Croson, 2009](#)). Consistent with this variation, the following analysis focuses on the decision to donate (i.e. the extensive margin). Specifically, we compare donation rates, defined as the number of donations per 1,000 impressions. Variation in the average amount donated (the intensive margin) is examined, too.

Randomization was conducted via the website. During a trial, a certain fraction of users (devices) is randomly sampled the first time they load a Wikipedia page. These users are then exposed, with equal chances, to either the control or the treatment banner of the trial.⁵ Users may see their banners repeatedly and might only donate after repeated exposure.⁶ This means that donation rates cannot be interpreted in terms of donations per user. As a consequence, our data do not allow to cluster standard errors at the user level; we only observe total impressions and donation outcomes. Hence, our inference will tend to over-reject the null of no effect.

⁵Using micro data on impressions, we confirmed that observables (e.g., time-stamps) are orthogonal to the treatment assignment.

⁶The assigned treatment is stored locally (cookie). Unless this information is deleted, a user would be confronted with at most 10 banner impressions.

Table 1: Overview of Trials

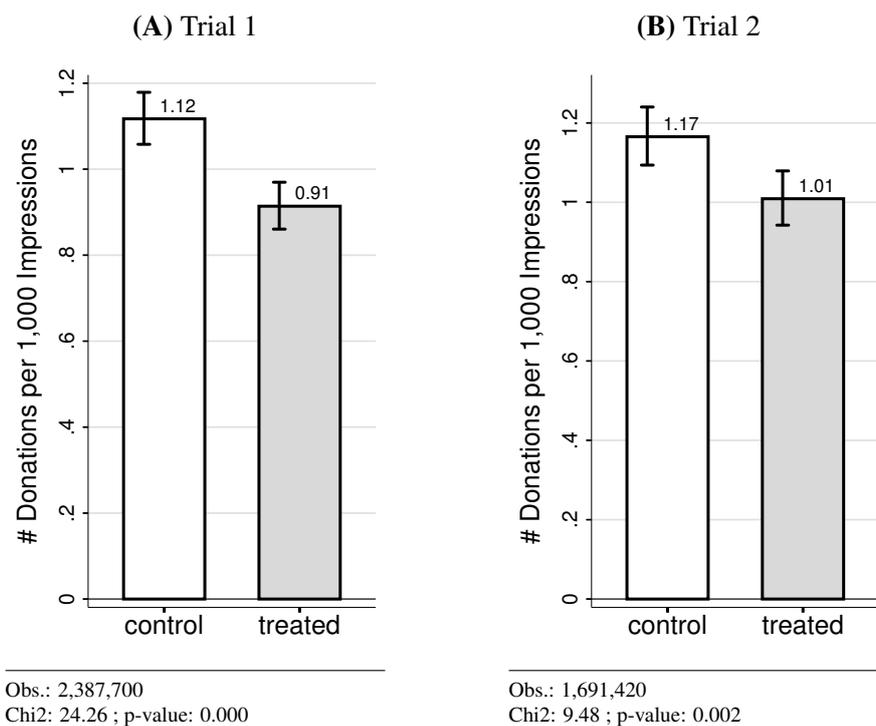
Trial	Group	Treatment text <i>Click on the texts below to display the full banner text online.</i>	Number of impressions	Number of donations	Total revenue (in EUR)	Average amount donated (in EUR)	Fundraising Year
Variation in framing (“only ...” vs. “already ...”)							
1	control	Our Donation Banner is viewed more than 20 Million times a day, but only 115.000 people have donate so far	1,189,600	1,329	27,012	20.32	2014
	treatment	Our Donation Banner is viewed more than 20 Million times a day. Already 115.000 people have donate so far	1,198,100	1,095	22,283	20.35	
2	control	Our Donation Banner is viewed more than 8 Million times a day, but only 28.300 people have donated so far	847,970	988	21,196	21.45	2015
	treatment	Our Donation Banner is viewed more than 8 Million times a day. Already 28.300 people have donated so far	843,450	851	17,223	20.24	
Variation in baseline numbers (cumulative vs. daily banner impressions)							
3	control	Our Donation Banner was viewed more than 184 Million times, but only 28.300 people have donated so far	3,268,600	3,383	69,072	20.42	2015
	treatment	Our Donation Banner is viewed more than 8 Million times a day, but only 28.300 people have donated so far	3,271,190	3,222	69,676	21.62	
4	control	Our Donation Banner is viewed more than 311 Million times a day, but only 28.300 people have donated so far	1,782,720	2,903	47,900	16.50	2015
	treatment	Our Donation Banner is viewed more than 7 Million times a day, but only 28.300 people have donated so far	1,782,740	2,916	46,474	15.94	
Direct variation in social information							
5	control	More than 450 Million people use Wikipedia, but less than 0.1% donate	616,400	1,881	38,259	20.34	2015
	treatment	More than 450 Million people use Wikipedia, but less than 1% donate	606,000	1,874	36,452	19.45	
6	control	In the last year, a total of 359.000 people donated to Wikipedia	1,010,430	1,210	23,357	19.30	2018
	treatment	Over the last years, more than 400.000 people donated to Wikipedia on average	1,016,130	1,178	23,263	19.75	

3 Results

3.1 Variation in framing

Figure 1 presents the results from trials 1 and 2. Relative to the control, which communicated the number of donors in a negative frame (“...but only N people donated ...”), the positive frames from the treatment banners (“already N people donated ...”) had a *negative* effect on the donation rates in both trials. The rate dropped from 1.12 to 0.91 per 1,000 impressions (−18.2%) in trial 1 and from 1.17 to 1.01 in trial 2 (−13.4%). Keeping the caveat about inference in mind (see above), we note that both effects are statistically significant at the 1%-level. In contrast, the average amount donated is statistically indistinguishable between treatment and control in both trials. The higher total amount of donations in the control conditions reported in Table 1 is thus driven by extensive margin effects.

Figure 1: Variation in framing

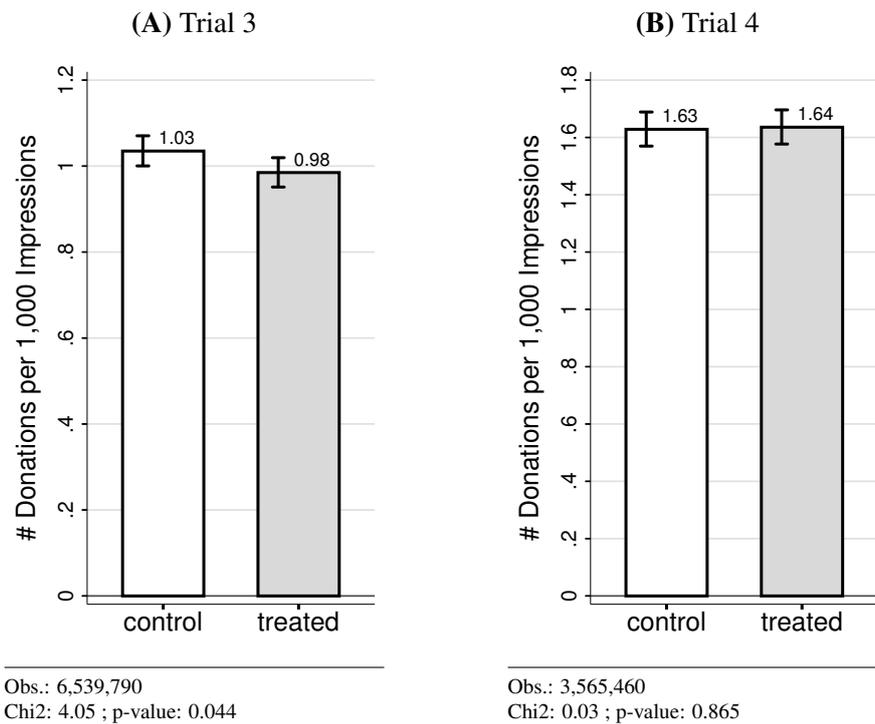


The findings are inconsistent with a conditionally cooperative donation behavior. Assuming that the positive framing provides a cue that other donors have a higher propensity to donate (relative to what is inferred from the negative frame in the control group banner), conditional cooperation would have implied a positive treatment effect. The data from trials 1 and 2 reject this hypothesis, indicating that, in fact, the positive frames decreased donation rates.

3.2 Variation in baseline numbers

Figure 2 presents the results from trials 3 and 4. Both trials contrasted a given number of donors with either large (control) or small (treatment) numbers of impressions, implying a relatively smaller or higher propensity to donation. Neither trial 3 nor trial 4 document a positive treatment effect. For trial 3, the donation rate dropped from 1.03 to 0.98 per 1,000 impressions (-4.8% ; $p = 0.044$). In trial 4, we observe an insignificant increase from 1.63 to 1.64 ($+0.4\%$). The average amounts donated and revenues are very similar across treatment and control (see Table 1).

Figure 2: Variation in baseline numbers



As long as the two treatments increase the perceived inclination to donate among other users, conditional cooperation would have again implied a positive treatment effect. However, this is not borne out by the data. In fact, the (weakly significant) findings from trial 3, point again into the opposite direction.

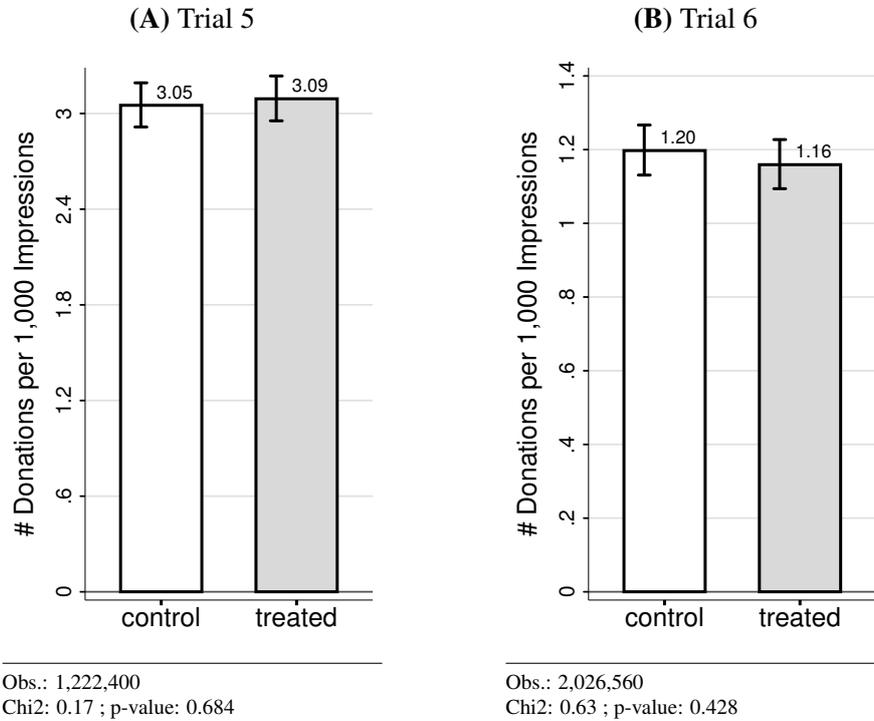
3.3 Direct variation in social information

Trials 5 and 6 directly varied social information. The former stressed that less than 0.1% (control) or less than 1% of users donated (treatment). The latter trial communicated a lower (control) or higher (treatment) absolute number of donors. The results, which are presented in Figure 3, do not indicate any statistically significant increase in donation rates. In trial 5, we observe a small increase in the donation rate from 3.05 to 3.09 per 1,000 impressions ($+1.3\%$).⁷ Finally, in the trial

⁷Donation rates in trial 5 are much higher than those observed for the other trials. Note that differences between trials are hard to interpret. They may be due to different sample periods, different banner layouts, colors or size.

designed by us, we find an insignificant negative treatment effect: the donation rate drops from 1.20 to 1.16 (−3.2%). Average amounts donated are not statistically different between treatment and control in both trials, and revenues are very similar.

Figure 3: Direct variation in social information



The last two trials, which offer the most straightforward variation in social information, provide again no evidence of conditional cooperation in donations among Wikipedia users in Germany.

4 Discussion

None of the six trials provides compelling evidence in support of conditional cooperation. On the contrary, several trials point into the opposite direction, indicating that signals about higher donation rates decrease Wikipedia users' inclination to donate. Why are Wikipedia users not donating in a conditionally cooperative manner?

Let us first compare our findings with other results in this field. Recall that most of the existing evidence on conditionally cooperative donations comes from trials that vary information about the donation amount (e.g. [Alpizar et al., 2008](#); [Shang and Croson, 2009](#)). Hence, this evidence is not directly comparable to our trials. One of the few pieces that experimentally varies social information about the rate of donors is [Frey and Meier \(2004\)](#). Among a student population, they communicate that either 46% (control) or 64% (treatment) of students have contributed to charitable funds in the past. Frey and Meier find a statistically insignificant treatment effect: the contribution

rate increases by 3.1%.⁸ While this is not too different from the null results observed in our trials 5 and 6, it conflicts with the significant negative effects observed in trials 1 and 2.

To explain the latter finding, it is worth considering the numerous channels that could drive the decision to donate. After all, conditional cooperation is an empirical pattern, not a theoretical concept. There is a vast range of mechanisms that could induce conditional cooperation. Information about others' inclination to donate might, for instance, induce conformity pressure (Bernheim, 1994; Goette and Tripodi, 2019) or strengthen the (perceived) social norm to support Wikipedia (Bicchieri, 2005). Our null results suggests that behavioral change is not occurring through these channels in our context. This might be due to the fact that the presented social information appears incongruous with the implicit normative expectation (see Bicchieri and Xiao, 2009) or is "too extreme" (i.e. highlighting relatively low donation rates) in the sense of Croson and Shang (2013). The latter argument, however, does not apply to trial 6, which communicated high absolute numbers.

The variation in social information might also be ineffective because a single user does not necessarily feel "socially close" to the overall population of Wiki users (Goette and Tripodi, 2019). Put differently, the communicated information might appear irrelevant and not indicative for the donation behavior of ones' true reference group. In addition, users may question the validity of the information – potentially in a self-serving manner of belief updating (Bicchieri et al., 2020). All these forces can contribute to the failure of norm nudging (Bicchieri and Dimant, 2019).

Another possible driver of conditionally cooperative donations could be signals about the value or quality of the provided public good (Vesterlund, 2003; Potters et al., 2007). However, since most Wikipedia users are familiar with the online encyclopedia, we doubt that this mechanism operates in our context. The absence of this channel again works towards finding null results.

In the context of online donations, with little scope to be observed by relevant others, self-signaling should play a key role. Information about others' behavior may impact the self-image value associated with a donation (e.g. Bénabou and Tirole, 2006, 2011). In fact, the self-identity return from donating might be *larger* if relatively few others are donating (if users perceive the own donation as more important in maintaining Wikipedia). Hence, self-signaling is a plausible channel that could, in principle, explain the negative treatment effects reported above.

Irrespective of the channels underlying the observed treatment (non-)responses, our findings add to a slim but growing body of evidence that challenges the notion that the provision of social information is a universally successful policy tool. We do not find evidence of conditional cooperation in online donations to Wikipedia. Instead, our results indicate that social information approaches might backfire.

⁸As noted above, Frey and Meier (2004) do find a significant effect once they condition on student's past donation or after including student fixed effects.

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Appendix (for online publication)

Figure A1: Layout of Text in the Banner of Trial 6 (German original)

Liebe Leserinnen und Leser, bitte verzeihen Sie die Störung. An diesem Freitag sind Sie in Deutschland gefragt:
Im letzten Jahr haben insgesamt 359.000 Menschen für Wikipedia gespendet. Wenn alle, die das jetzt lesen, einen kleinen Beitrag leisten, ist unsere Spendenkampagne in einer Stunde vorüber. Sicher könnten wir mit Werbung eine Menge Geld verdienen. Aber dann wäre Wikipedia komplett anders. Wir könnten ihr nicht vertrauen. Deshalb wird Wikipedia durch Spenden finanziert. Wenn Sie Wikipedia nützlich finden, nehmen Sie sich an diesem Freitag bitte eine Minute Zeit und geben Wikipedia mit Ihrer Spende etwas zurück. Vielen Dank!

Note: The figure is the main banner text of the control treatment of Trial 6. An English translation is provided below:

Dear Readers, please excuse the disturbance. This Friday we ask you in Germany:

In the last year, a total of 359.000 people donated to Wikipedia. [Treatment: Over the last years, more than 400.000 people donated to Wikipedia on average.] If everyone reading this gave a small amount, our campaign would end in an hour. Sure, we could make a lot of money with ads. But then Wikipedia wouldn't be the same. We wouldn't be able to trust it. This is why Wikipedia is funded by donations. If you consider Wikipedia useful, please take a minute and, with your donation, give something back to Wikipedia. Many thanks!