



Delayed negative effects of prosocial spending on happiness

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Does prosocial behavior promote happiness? We test this long-standing hypothesis in a behavioral experiment that extends the scope of previous research. In our Saving a Life paradigm, every participant either saved one human life in expectation by triggering a targeted donation of 350 euros or received an amount of 100 euros. Using a choice paradigm between two binary lotteries with different chances of saving a life, we observed subjects' intentions at the same time as creating random variation in prosocial outcomes. We repeatedly measured happiness at various delays. Our data weakly replicate the positive effect identified in previous research but only for the very short run. One month later, the sign of the effect reversed, and prosocial behavior led to significantly lower happiness than obtaining the money. Notably, even those subjects who chose prosocially were ultimately happier if they ended up getting the money for themselves. Our findings revealed a more nuanced causal relationship than previously suggested, providing an explanation for the apparent absence of universal prosocial behavior.

happiness | wellbeing | prosocial behavior | altruism

Happiness is a key concept and building block of modern societies. Philosophers put happiness center stage as a fundamental driving force, life goal, and even natural right of humans (1–4). Recently, subjective wellbeing has seen rising acceptance as a key welfare indicator, and a growing number of countries have by now incorporated national happiness levels into their economic policy objectives (4, 5). Likewise, the nature of prosocial behavior has attracted sustained interest for centuries as an identifying feature of human existence. Scholars across diverse fields including philosophy, psychology, economics, political science, and neuroscience have studied the consequences of other-regarding behavior at the individual and the societal levels (6–9). A long-standing hypothesis establishes a connection between happiness and prosociality, suggesting that prosocial behavior is a vital source of happiness.* Recently, scientific interest has surged anew, putting the validity of the proposed relationship to the test. This empirical literature forcefully argues for a positive association between prosocial behavior and happiness (11–19). Causal evidence in support of this “psychological universal” (18) is more scant, however, and restricted to short-run effects in low-stakes decision environments. Moreover, little is known about how happiness derived from prosocial outcomes interacts with individual prosocial motivation. To put the hypothesis of a causal relation between prosociality and happiness to a comprehensive test, we designed a behavioral experiment that extends previous work along various dimensions. Compared with the decisions typically studied in experimental research, many real-life decisions have more far-reaching and lasting consequences with important implications for the nature and temporal patterns of derived happiness. We, therefore, created a high-stakes decision environment, exposing subjects to the tradeoff between saving a human life in expectation and receiving money. This paradigm creates a meaningful prosocial choice context and full awareness about the self-benefiting counterfactual. In practice, resources not spent prosocially can be spent on an alternative purpose from which

people may derive happiness on its own. Awareness about the alternative of acting prosocially is a crucial feature of real-life prosocial choice that sets our study apart from previous experimental work. To examine the temporal profile and stability of the effect of prosociality on happiness, we measured happiness at various points in time. This accommodates the idea that most activities generate distinct time-varying patterns of happiness. Finally, using a lottery design, we simultaneously generated random assignment of prosocial outcomes and elicited subjects' prosocial motivation. This allows studying the causal effect of prosocial outcomes for different “types” of subjects and helps uncover motivational channels, such as effects stemming from subjects getting or not getting what they actually prefer.

Saving a Human Life Paradigm

We developed the Saving a Life paradigm in cooperation with the Indian nonprofit organization Operation ASHA. Operation ASHA specializes in the treatment of tuberculosis, an infectious disease caused by bacteria. With an estimated global death toll of 1.7 million people in 2016, tuberculosis kills more people than HIV or malaria, making it the deadliest infectious

Significance

Governments around the world increasingly acknowledge the role of happiness as a societal objective and implement policies that target national wellbeing levels. Knowledge about the determinants of happiness, however, is still limited. A longstanding candidate is prosocial behavior. Our study empirically investigates the causal effect of prosocial behavior on happiness in a high-stakes decision experiment. While we confirm previous findings of a positive effect in the short term, our findings distinctly show that this effect is short lived and even reverses after some time. This study documents that prosocial behavior does not unequivocally increase happiness because prosocial spending naturally requires giving up something else, which may decrease happiness in its own right.

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The authors declare no competing interest.

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Data deposition: All experimental protocols, data, and code used to analyze the data are publicly available on the IZA Data Set Repository (DOI: [10.15185/briq.201914324](https://doi.org/10.15185/briq.201914324)).

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*This hypothesis dates back to at least 2 millennia to Aristotle's *The Nicomachean Ethics* (10), in which he suggests a fundamental link between wellbeing, eudemonia, and moral behavior

disease of today.[†] Highly effective treatment with antibiotics is available for the drug-susceptible version of tuberculosis. We calculated the cost of a life saved by Operation ASHA based on public information on the charity's operations in combination with estimates from peer-reviewed epidemiological studies on tuberculosis mortality for the specific type of treatment and location considered (20–22). Under conservative assumptions, a donation of 350 euros—roughly \$400 at the time—covers all costs incurred by Operation ASHA to identify, treat, and cure five more patients, which is equivalent to saving one additional human life in expectation (*SI Appendix* has more details).[‡] To construct a strong alternative to saving a life that constitutes the individual opportunity cost of a prosocial outcome, every study participant who did not save a life received a payment of 100 euros. This payment implemented a salient self-benefiting counterfactual to the prosocial outcome. Our binary setting generated a strong moral conflict,[§] the tradeoff between avoiding harm and receiving money.

This study was not a thought experiment. For each subject, we either initiated an actual donation of 350 euros or an actual payment of 100 euros. Moreover, our paradigm accommodates the common critique of donation experiments that subjects could take the money to donate it for other purposes such that the seemingly selfish option would in fact be altruistic. In our setting, this is essentially ruled out given that foregoing 100 euros generated a substantially larger donation of 350 euros, which was spent in a highly cost-effective manner. Identifying the causal effect of prosociality on happiness requires exogenous variation in whether subjects save a life or receive the money. Randomly allocating subjects into either condition, however, makes it impossible to observe which option a subject would choose for herself, which is a precondition for distinguishing between rather prosocial and rather selfish types. Not knowing a subject's choice, we would not be able to tell, for example, whether a subject who saved a life and later reports to be relatively unhappy is simply dissatisfied with not getting her desired outcome. To circumvent the dilemma between observing voluntary choice and generating random variation, we implemented a lottery procedure where subjects had to choose between two lotteries: Lottery A and Lottery B. Lottery A was the prosocial lottery. Choosing this lottery, the subject saved a life with 60% probability and received money with 40% probability: that is, $L_A = (0.6, 350\text{-euro donation}; 0.4, 100\text{-euro payment})$. Lottery B, the selfish lottery, featured the reverse probabilities: that is, this lottery saved a life with only 40% probability and generated additional earnings of 100 euros with 60% probability so that $L_B = (0.4, 350\text{-euro donation}; 0.6, 100\text{-euro payment})$. Our procedure simultaneously provided random variation allowing for a causal identification of the effect of prosociality on happiness as well as information on subjects' prosocial inclinations. Specifically, by choosing lottery A rather than lottery B, a subject made the prosocial outcome 50% more likely. The lottery procedure produced four different study groups. Outcomes were aligned with choices for those subjects who chose the prosocial lottery and ended up saving a life and for those who chose the selfish lottery and received 100 euros. Outcomes and choices were not aligned among subjects who picked the prosocial lottery but received money and

for subjects who chose selfishly but nevertheless saved a life, respectively.

Our main measure of interest was subjects' self-reported happiness. Subjects completed the statement "In general, I consider myself" with responses ranging from 1 = "not a very happy person" to 7 = "a very happy person" on a Likert scale (25). To account for potential temporal patterns, we elicited happiness at three points in time (Fig. 1). The first measurement, H_{Baseline} , provided an individual-specific baseline level of happiness at the very beginning of the laboratory session before the Saving a Life paradigm was presented. The second measurement, $H_{\text{Short-run}}$, was elicited shortly after the lottery was drawn (i.e., after subjects had learned about the respective outcome). Finally, $H_{\text{Long-run}}$ was measured 4 wk after the laboratory session in an online survey. In between the second and third measurements, we sent three emails to all subjects exactly 1, 3, and 4 wk after the laboratory session. The purpose of the first two emails was to remind subjects of the content and outcome of the laboratory session.[¶] The third email invited subjects to participate in the follow-up online survey. The lottery outcome from the experiment was implemented exactly after 2 wk between the first and second reminders. The corresponding transfer was said to be "in process" in the first email and "executed" in the second email. By the time that the third email invited subjects to participate in the online survey after 4 wk, the donation or personal bank transfer had already been carried out 2 wk earlier. In addition to the happiness measures, we obtained self-reports of subjects' self-image, measured as agreement with the statement "I am a good person," and of subjects' mood. The happiness, self-image, and mood questions formed part of a questionnaire including various other items so as to obfuscate the purpose of the study and to reduce experimenter demand effects.

We ran 10 laboratory sessions with a total of 325 subjects. Of those, 297 also participated in the follow-up online survey 4 wk later and constitute our sample for the main analysis.[#] We took particular care that anonymity was preserved among subjects: no subject observed or learned about the decision of another subject at any point during the experiment. Subjects were seated in isolated cabins, and their computer screen could not be observed by any other subject. The payment of subjects was conducted electronically by bank transfer, and thus, no subject learned how much money another subject had earned. We also ran two treatments for further analyses, one with 45 and one with 221 subjects (*Robustness*). In sum, we used data from 591 subjects. As a consequence of the experiment and all subjects' decisions, we paid subjects a total of 40,764 euros and sent 111,300 euros to the charity, resulting in an estimated number of 318 saved lives.

Note that the distinction between choice, outcome, and the interaction between these two is a central feature of our paradigm. Subjects initially opted for one of the two lotteries, and conditional on the lottery choice, we were able to identify the causal effect of saving a life vs. receiving money. For the short run, our main prediction was a positive causal effect of saving a life on happiness. This would be in line with the existing body of evidence that analyzes the short-run effect of prosocial outcomes (11–14). In addition, we expected a positive (noncausal)

[†]The World Health Organization tuberculosis fact sheet is available at <http://www.who.int/mediacentre/factsheets/fs104/en/>.

[‡]Note that, whenever we talk about human lives saved based on donations to Operation ASHA, we refer to lives that were saved in expectation at the time that subjects participated in the study. A related study using donations to fight diseases with potential life-saving consequences is in ref. 23. Their paradigm triggered donations of about 10 euros for measles vaccinations.

[§]A general notion of morality defines immoral behavior as harming others in an unjustified and intentional way (24).

[¶]Specifically, each email stated that in the study "you could make a decision about whether you rather want a human life to be saved for you, or whether you rather want to receive an additional payment of 100 euros." Moreover, the text reminded that the subject would "receive an additional payment of €100" or that she "arranged for a donation in the amount of 350 euros for the treatment and cure of tuberculosis patients, such that one human life is saved in expectation" (full text is in *SI Appendix*).

[#]Note that the relative frequency of prosocial lottery choice as well as other personality measures did not systematically differ for subjects who did not complete the follow-up survey (*SI Appendix*).

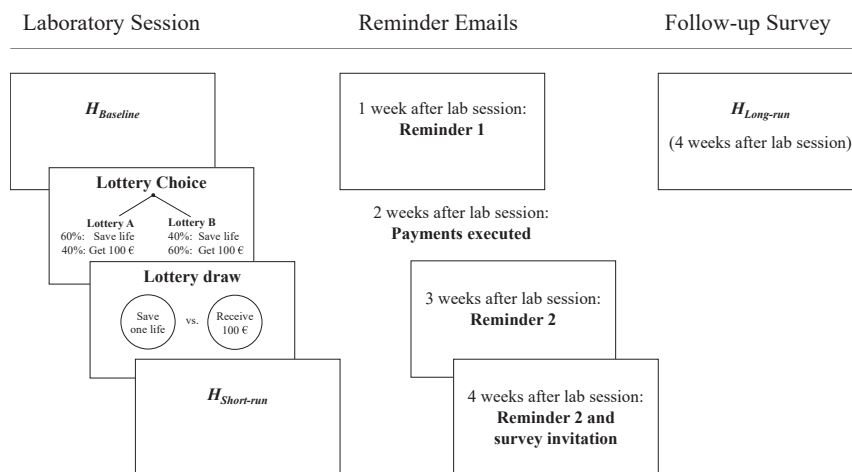


Fig. 1. The lottery choice paradigm and repeated happiness measurements. In the initial laboratory session, each participant chose between two lotteries, the “prosocial” Lottery A and the “selfish” Lottery B. Based on their individual lottery draw, subjects either received 100 euros or saved one human life in expectation, in which case the experimenter transferred a donation of 350 euros to a charity that fights tuberculosis. The laboratory session was followed by an online survey 4 wk later. We elicited happiness three times: at the beginning ($H_{Baseline}$) and at the end ($H_{Short-run}$) of the laboratory session and again in the survey ($H_{Long-run}$). We sent out two personalized emails reminding participants of their individual lottery outcome between the laboratory session and the survey.

effect of the prosocial choice itself in as much as choosing the prosocial lottery might improve a person’s self-image (26–28), feel like “the morally right thing to do,” or generate positive emotions (“warm glow”) (29). Moreover, we hypothesized that the alignment of choice and lottery outcome (i.e., whether people got what they wanted) would affect mood, which might spill over to happiness. A person who picked the selfish lottery but saved a life might partly be less happy due to not getting her preferred outcome.

For the long run, the literature provides no specific prediction because existing causal evidence is limited to the short run. First, with respect to the causal effect of the prosocial outcome, one may expect that timing matters. Saving a life can provide happiness through a mental form of consumption from thoughts or memories that occurs entirely in the mind (30). Such “conceptual consumption” presumably occurs in temporal proximity to the experiment but fades as time passes. Money, by contrast, generates happiness based on what a person buys with it and when. Happiness is then linked to the time when actual consumption occurs, which can be spread out over time. The long-term causal effect of the prosocial vs. the selfish outcome is, therefore, ambiguous (i.e., even a negative effect is conceivable). Second, we hypothesized that the effect of prosocial choice wanes over time because past choices become less and less accessible to people’s mind and thus, lose relevance for generating positive self-image or feelings of warm glow.

To analyze the happiness data, we split the sample along two dimensions. The lottery choice provided an endogenous dichotomy between more prosocial and more selfish subjects. The outcome as determined by the individual lottery draw was fully random conditional on lottery choice and allowed for causal inference. For each subject in each of the four study groups, we calculated two individual differences of reported happiness scores in the short and long run relative to the baseline level of happiness. That is, for each subject, we obtained $\Delta_{Short-run} = H_{Short-run} - H_{Baseline}$ and $\Delta_{Long-run} = H_{Long-run} - H_{Baseline}$. These measures indicated individual-level changes in happiness over time. By comparing group averages of those individual changes, we can assess how different lottery choices and lottery outcomes affected changes in happiness. For these analyses, we standardized happiness scores at each point in time. We complemented this group comparison with regres-

sion analyses to assess the size and significance of the main and interaction effects. We regressed the standardized level of a short-run or long-run measurement on an indicator variable that equals one if a subject chose the prosocial lottery and zero otherwise, an indicator variable that is one if the subject’s lottery draw determined that she would save a life and zero if she received the money, an interaction term between these two variables, and the baseline level of the dependent variable.

Prosocial Behavior Promoted Happiness in the Short Run

Overall, 60% of subjects ($N = 178$) chose the prosocial lottery. Based on the random lottery draws, 53% of the entire sample actually saved a human life ($N = 158$). Fig. 2A shows our main finding for the short run. Displayed is the mean change in happiness from the beginning to the end of the laboratory session, $\Delta_{Short-run}$. We made three observations on the short-run change in happiness. First, we found a positive, albeit weak, relationship between prosocial outcome and happiness, similar to previous evidence. Irrespective of lottery choice, the outcome of saving a life was causally related to higher mean changes in happiness. The main effect of saving a life is an increase in happiness by 0.06 SD ($P < 0.1$) (Table 1, column 1).^{||} Note that all calculated main effects are reported in Table 1. Moreover, we found that choosing the prosocial lottery was associated with a positive change in happiness, irrespective of the actual lottery outcome. The magnitude of the (noncausal) relationship was 0.14 SD ($P < 0.1$) (Table 1, column 1). Note, however, that size and significance of both main effects were only moderate. Considering point estimates of mean changes in happiness in Fig. 2, we observed a gradual decline from the prosocial choice and prosocial outcome group to the prosocial choice and selfish outcome group, followed by the selfish choice and prosocial outcome group and, finally, the selfish choice and selfish outcome group. Moreover, the insignificant interaction effect of

^{||} The main effect of saving a life (compared with receiving money) is the average of the effects for those who chose the prosocial lottery and those who chose the selfish lottery. This main effect is reported in Table 1 below the regression coefficients. Note that the coefficients reported in row 2 in Table 1 indicate the estimated effect of saving a life for those who chose the selfish lottery.

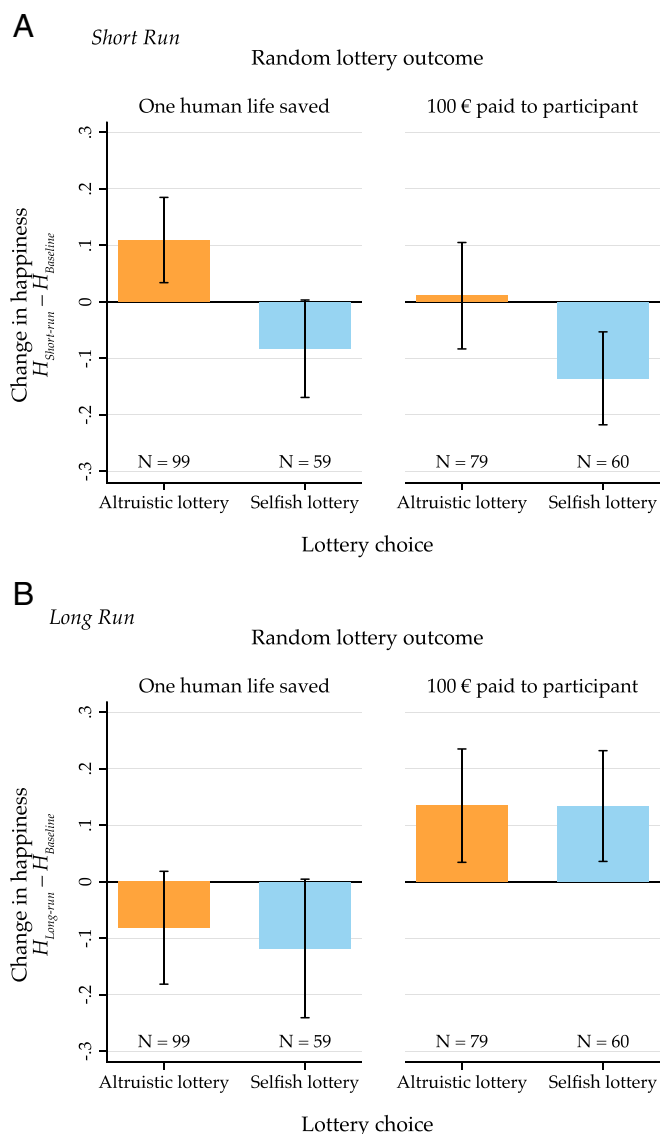


Fig. 2. Prosocial behavior increased happiness in the short run but decreased it in the long run. **A** shows the mean changes in self-reported happiness between the end and the beginning of the laboratory session for each of the four study groups. Regression analyses confirmed a causal main effect of saving a life (0.06 SD, $P < 0.1$) (Table 1, column 1) and a (noncausal) positive main effect of choosing the prosocial lottery (0.14 SD, $P < 0.1$) (Table 1, column 1). **B** displays mean changes in happiness after 4 wk compared with the beginning of the laboratory session. The causal effect of saving a life on happiness after 4 wk was negative and quantitatively large (-0.26 SD, $P < 0.01$) (Table 1, column 4). Happiness scores were standardized at each point in time. $N = 297$. Error bands indicate ± 1 SEM.

lottery choice and lottery outcome in the regression implied that changes in happiness were not driven by participants getting or not getting the outcome they wanted as inferred from their lottery choice (Table 1, column 1).

Second, we documented pronounced effects of both prosocial choice and outcome on changes in the measure of subjects' self-image. Subjects who chose the prosocial lottery reaped self-image benefits as indicated by a quantitatively large correlational effect (0.38 SD, $P < 0.01$) (Table 1, column 2). More compellingly, the random variation in lottery outcomes identified a sizable and significant causal effect of saving a life conditional on preceding choice (0.25 SD, $P < 0.01$) (Table 1, column 2).

As with happiness, we found no significant interaction between choice and outcome, suggesting that obtaining the desired outcome rather than the alternative did not in itself affect changes in happiness or self-image.

Third, in contrast to happiness and self-image, changes in mood strongly reflected whether subjects got what they wanted. Choosing prosocially was associated with an increase in a person's mood but only if she indeed ended up saving the life (0.54 SD, $P < 0.01$) (Table 1, column 3); this coefficient is calculated as the sum of the interaction coefficient, 1.16, and the marginal effect of lottery choice, -0.62 . Mood declined by a similar magnitude after opting for the prosocial lottery if that person instead got the money (-0.62 SD, $P < 0.01$) (Table 1, column 3) such that the main effect of choice across both groups was close to 0 and insignificant (-0.04 SD, $P = 0.91$) (Table 1, column 3). Considering the effect of randomized lottery outcomes, we found that saving a life did not significantly affect changes in mood of subjects who chose the selfish lottery (0.21 SD, $P = 0.38$) (Table 1, column 3) but led to a strongly positive and significant effect on those who picked the prosocial lottery (1.36 SD, $P < 0.01$) (Table 1, column 3); this coefficient is calculated as the sum of the interaction coefficient, 1.16, and the marginal effect of lottery outcome, 0.21.

Negative Effect of Prosocial Behavior on Happiness in the Long Run

For the long-run effects on happiness, we performed analyses analogous to the short run but this time based on group averages of changes in happiness observed 4 wk later, $\Delta_{Long-run}$. The key finding is presented in Fig. 2B. We found a strongly negative causal effect of saving a life on happiness. Most notably, this effect was independent of the lottery choice. This means not only those subjects who picked the selfish lottery but also, those who opted for the prosocial lottery reported substantially higher levels of happiness if they ended up receiving the money rather than saving a life. Moreover, the effect on happiness was quantitatively large. Regression results showed that saving a life decreased long-run happiness by 0.26 SD ($P < 0.01$) (Table 1, column 4) relative to receiving money, conditional on individual-specific baseline levels of happiness. This finding was in marked contrast to the positive short-term association documented in our own study and other studies. It also implied a pronounced temporal pattern of happiness derived from prosocial behavior. In fact, the sign of the causally induced change in happiness switched over time. We find that the main effects of the lottery outcome in the short and long runs are highly significantly different ($P < 0.005$) (Table 1, column 4). Moreover, as time passed, the outcome got relatively more important than the choice in determining happiness. In the short run, our data revealed marginally significant positive main effects of prosocial lottery choice (0.14 SD, correlational) (Table 1, column 1) and of saving a life (0.06 SD, causal) (Table 1, column 1), while long-term happiness was swayed by a significant and sizable negative causal effect of saving a life (-0.26 SD) (Table 1, column 4).

Interestingly, we find that receiving the money made even those subjects relatively happier than saving a life who initially chose the altruistic lottery (difference in predicted standardized long-run happiness $d = -0.23$, $P < 0.05$) (based on column 4 of Table 1). This group credibly revealed prosocial intentions but was randomly selected to experience the self-benefiting outcome ex post. While this kept them from actually saving a life, they did not have to sacrifice the high payment, and they were able to tell themselves (and/or others) that they had done what was in their power to bring about the prosocial outcome. We completed our analysis of the long-term results by considering self-image and mood. Substantial effects on these measures observed in the short term for both choice and outcome faded as time passed

Table 1. Regression analyses of the effect of prosocial behavior on happiness, self-image, and mood in the short and long run

Dependent variable (standardized)	Short run			Long run		
	1) Happiness	2) Self-image	3) Mood	4) Happiness	5) Self-image	6) Mood
Lottery choice: 1 if altruistic, 0 if selfish	0.11 (0.112)	0.41*** (0.135)	-0.62*** (0.149)	-0.05 (0.129)	0.28** (0.128)	0.17 (0.172)
Lottery outcome: 1 if life saved, 0 if money received	0.03 (0.116)	0.28** (0.132)	0.21 (0.179)	-0.29* (0.150)	0.25 (0.159)	0.14 (0.190)
Altruistic lottery choice × life saved	0.06 (0.159)	-0.05 (0.166)	1.16*** (0.212)	0.06 (0.190)	-0.27 (0.193)	-0.14 (0.235)
Baseline happiness (at beginning of session)	0.77*** (0.065)			0.61*** (0.056)		
Baseline self-image (at beginning of session)	0.52*** (0.033)			0.46*** (0.041)		
Baseline mood (at beginning of session)				0.10** (0.037)		
Constant	-3.65*** (0.316)	-4.45*** (0.279)	-0.84*** (0.302)	-2.64*** (0.294)	-3.83*** (0.344)	-1.47*** (0.356)
Main effect choice: altruistic lottery ↔ short run = long run (χ^2 statistic)	0.14*	0.38***	-0.04	-0.02 2.29	0.14 4.76**	0.11 0.94
Main effect outcome: life saved ↔ short run = long run (χ^2 statistic)	0.06*	0.25***	0.78***	-0.26*** 8.39***	0.12 1.44	0.07 24.34***
R ²	0.5426	0.5564	0.3127	0.3642	0.391	0.08326
N	297	297	297	297	297	297

Displayed are regression results that complement the findings in Fig. 2 using ordinary least squares. Columns 1 to 3 present the short-run results, and columns 4 to 6 present the long-run results. In each column, we regressed a standardized happiness score, self-image score, or mood score on an indicator variable that equals one if a subject chose the prosocial lottery and zero otherwise (row 1); an indicator variable that is one if the subject's lottery draw determined that she would save a life and zero if she received the money (row 2); a term capturing the interaction between these two variables (row 3); and the standardized baseline level of the dependent measure (rows 4 to 6). All regressions include a constant. Analogous ordered probit regressions are reported in *SI Appendix, Table S2*. Robust SEs are in parentheses. The asterisks indicate significance levels of two-sided *t* tests for the null hypothesis that the regression coefficient equals zero. The table also displays *F* tests unless indicated otherwise. * $P < 0.1$; ** $P < 0.05$; *** $P < 0.01$.

(Table 1, columns 5 and 6). In fact, the main correlational effect of altruistic choice on self-image as well as the main causal effect of saving a life both decreased highly significantly from the short to the long run ($P = 0.029$ and $P < 0.0001$, respectively) (Table 1, columns 5 and 6).

Robustness

A number of additional analyses examined whether our findings were the artifact of specific experimental design choices. One feature that distinguishes the Saving a Life paradigm from previous studies is stake size. We validated the credibility of the paradigm in a separate calibration treatment run on a new set of subjects. For each subject, we elicited the minimum amount of money that she preferred over saving a life by triggering a donation of 350 euros. We used an incentive compatible price list method such that each subject indeed either saved a life or received money (*SI Appendix*). In a sample of 45 students, we found that the median valuation of the 350-euro donation was a payment of 200 euro to the subject, an amount close to the average monthly disposable income of a German student. That subjects were willing to forgo substantial amounts of money shows that the high-stakes experimental paradigm was credible to most people. Based on the calibration, we chose an amount of 100 euros for our main treatment, which provides a greater contrast to the amount of the donation. We, therefore, expected more than 50% of subjects to be willing to save a life in our main experiment, which at 60%, was the case.

Next, we investigated the confirmatory validity of personality measures that the existing literature has linked to prosociality (i.e., we tested whether prosocial lottery choice in our data was predicted in a plausible manner by these measures). Reassuringly, we found that higher cognitive skills, higher levels of altruism, and stronger empathic concern were all positively asso-

ciated with the propensity to choose the prosocial lottery (*SI Appendix* has details). Most importantly, our measure of altruism (31) strongly predicted lottery choice.

One concern about using lotteries is that classifying subjects as either selfish or prosocial might be less informative in comparison with using a deterministic choice environment. On the one hand, the lottery provides the opportunity to perform a prosocial act without necessarily incurring the cost of foregoing the payment, which might increase prosocial choice. On the other hand, picking the prosocial lottery might be perceived as less virtuous than saving a life directly, decreasing the motivation for prosocial choice. To address this concern, we ran an additional treatment in which a separate set of subjects made a deterministic binary choice between either saving a life and receiving no money or not saving a life and receiving 100 euros ($N = 221$). Reassuringly, 57% of subjects in the deterministic condition chose to save a life, which is statistically indistinguishable from the fraction of 60% of subjects who chose the prosocial lottery in our main treatment [Pearson χ^2 test, $\chi^2_{(1)} = 0.4453$, $P = 0.49$]. Moreover, none of the personality measures elicited in the survey differentially predicted lottery choice and the direct choice to save a life (*SI Appendix*). According to these analyses, the lottery choice closely captures how subjects would have chosen if they had been offered the direct deterministic choice, lending further credibility to our main lottery treatment and the corresponding type classification.

Discussion

In the short run, our results were similar to the current scientific consensus of a positive relationship between prosocial behavior and happiness. Extending previous results, we documented that prosocial choices and prosocial outcomes were independently associated with happiness. Whether subjects received

their desired outcome affected mood but not happiness or self-image. In addition, the data hinted at the importance of image concerns in the short run, a key driver of prosocial behavior in a large class of economic models of prosociality (26–28). In the longer run, our main finding was that prosocial behavior causally reduced happiness compared with obtaining money. This casts doubt on our previous understanding of the relationship between prosociality and happiness, which—based on short-run evidence—suggested a uniformly positive effect.

Our findings indicate that happiness derived in the short vs. long run is partly driven by different factors. In the short term, happiness may be governed by visceral factors and the conceptual consumption (30) associated with the act of giving, such as warm glow (29) and a favorable self-image (26–28). That these specific factors play a role in shaping happiness in the short run was confirmed by our data. As time passes, however, the prosocial act itself might become less salient and top of mind, and the effect of positive emotions and thoughts vanishes. In contrast, money may be a continuing source of happiness if spent gradually and hence, leading to consumption that is spread out over time. In fact, empirical research has shown that monetary windfall gains can positively affect happiness (31). Moreover, in our design, the forgone payment of 100 euros deliberately implemented a “cost of saving a life,” which was known to all subjects. This by itself might have affected happiness derived from saving a life. Research on the nature of prosocial behavior has shown that the set of available alternatives plays a key role (e.g., in determining what people deem fair) (32).

Our results add to the recent debate on effective altruism, an evidence-based philosophy that advocates benefiting others in the most efficient way (33, 34). A positive correlation between prosocial behavior and happiness is a central empirical justification for the quest to donate more. Philosopher Peter Singer forcefully argues that altruism is not about self-sacrifice, but that the greatest happiness arises from helping other people (33). Our findings indicate that this notion may be incomplete.

Relatedly, they speak to a puzzle pointed out in the existing literature. If the overall relationship between prosociality and happiness was as strong and unambiguously positive as suggested by short-run studies, people who maximize their happiness should behave much more prosocially in practice than they actually do (11). Previous work points out that people might miscalculate their own happiness. In contrast, our findings suggest that people may instead trade off the short-term benefit of prosocial behavior against the delayed costs.

Methods

The research performed in this article involved the collection of data in a behavioral choice experiment with a total of $N = 591$ student participants at the BonnEconLab of the University of Bonn, Germany, in September 2016. In our main sample, Lottery Choice ($N = 325$), subjects chose between two lotteries, Lottery A (with probability 60%: save a human life in expectation by triggering a donation of 350 euros; with probability 40%: receive 100 euros) and Lottery B (with probability 40%: save a human life in expectation by triggering a donation of 350 euros; with probability 60%: receive 100 euros). In a control condition, Deterministic Choice ($N = 221$), participants directly decided between saving the human life in expectation and receiving the money. In a third treatment condition, the Calibration Sample ($N = 45$), we elicited the minimal monetary amount that would make a participant indifferent to saving a life in expectation. The study was approved by the Ethics Committee of the Economics Department at the University of Bonn (reference no. 2016-02), and all subjects provided informed consent before participating. All details of the experiments are reported in [SI Appendix](#).

Data Availability. All experimental protocols, data, and code used to analyze the data are publicly available on the IZA Data Set Repository (DOI: 10.15185/briq.201914324). Preliminary results from the experimental study were discussed in the graduate thesis of T.G. (35).

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