ORIGINAL RESEARCH REPORT

Under What Conditions Does Prosocial Spending Promote Happiness?

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Under what conditions does prosocial spending promote happiness? In a series of appropriately powered and pre-registered experiments, the present research revisited the role of impact, social connection, and perceived choice in maximizing the emotional benefits of spending money on others. In two exploratory studies, we found that happy (vs. less happy) prosocial spending experiences were marked by higher levels of impact, social connection and perceived choice (Study 1a and 1b). Consistent with these initial findings, three pre-registered studies confirmed that spending money on others was particularly rewarding when people were able to see the difference their generosity made (Study 2); when they felt a sense of social connection to the person or cause they were helping (Study 3); and when they felt that the decision to help was freely chosen (Study 4). Together, our findings corroborate previous research on impact, social connection and perceived choice, and highlight the importance of considering these key variables when evaluating old and new evidence on the emotional benefits of prosocial spending. In addition, our findings suggest that charitable organizations and policymakers should review their current solicitation strategies and pay more attention to people's sense of impact, connection and choice when seeking charitable donations.

Psychological research has shown that spending money on others—termed *prosocial spending*—can promote happiness (e.g., Aknin, Broesch, Hamlin, & Van Vondervoort, 2015; Aknin et al., 2013a; Dunn, Aknin, & Norton, 2008). Subsequent studies have examined key moderators of this basic effect; this body of research suggests that people derive more joy from prosocial spending when they can easily see how their generosity has made a difference, when they feel a sense of connection with those they are helping, and when they feel that the decision to give was freely chosen (for a brief review, see Aknin, Whillans, Norton, & Dunn, 2019). Unfortunately, however, most studies examining these moderators relied on small sample sizes and other potentially problematic research practices. Following the "replication crisis," researchers now recognize that the risk of false positives can be unacceptably high when researchers capitalize on flexibility in data analysis (Simmons, Nelson, & Simonsohn, 2011) or utilize small sample sizes (e.g., Button et al., 2013; Fraley & Vazire, 2014). While some recent studies in this area have utilized larger samples and emerging best practices (e.g., pre-registration) in examining whether prosocial spending increases happiness (e.g., O'Brien & Kassirer, 2018; Whillans, Aknin,

Ross, Chen, & Chen, 2018), these studies were not designed to investigate the conditions under which prosocial spending produces the greatest benefits. Thus, the goal of the present research was to apply current best practices to examine key variables that should catalyze the benefits of prosocial spending.

Prosocial Spending and Happiness: Key Catalysts

According to self-determination theory (Ryan & Deci, 2000), people have a need to feel that they can take effective action in the world (*competence*), that they are connected to those around them (*relatedness*), and that they are free to make their own choices (*autonomy*). Theoretically, helping others should be more likely to promote happiness when giving provides an opportunity to satisfy each of these fundamental human needs. In addition, people should find giving particularly rewarding when these needs have otherwise gone unmet. To test this proposition, Hui and Kogan (2018) recruited a community sample of 383 adults, who rated their level of need satisfaction multiple times per day for two weeks. At each time point, they were asked also how often they had engaged in prosocial behavior during the past couple of hours. When people had been experiencing low levels of competence, relatedness, or autonomy, engaging in prosocial behavior had a particularly beneficial effect on their subsequent mood. This study was well-powered, but

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the use of a correlational design precludes strong causal inferences. Because identifying the causal impact of key catalysts demands the use of experimental methodology, we review experimental research on each variable in turn below, using self-determination theory as an organizing framework.

Competence

Aknin, Dunn, Whillans, Grant, & Norton (2013b) proposed that giving to others should fulfill the fundamental need for competence when people can easily see or envision how their generosity has made an impact, highlighting their capacity to take effective action in the world. To test this possibility, Aknin et al. (2013b; Study 1) provided participants with the opportunity to make a donation to charity. One group of participants ($n = 62$) was invited to donate to UNICEF, while another group ($n = 58$) was invited to donate to Spread the Net. These two charities were partners and shared the same mission of promoting children's health around the world. Whereas UNICEF is a very broad charity—potentially making it hard for donors to envision how their contribution will make a difference— Spread the Net offered a simple, concrete promise: For every \$10 contributed, they would supply a mosquito bed net to protect a child from malaria. The more participants donated to Spread the Net, the happier they felt afterward. In contrast, giving to UNICEF did not yield any detectable emotional benefits. These findings are consistent with the hypothesis that people derive more happiness from giving to others when they can easily comprehend how their actions will make a difference.

Of course, these charities also differ on other dimensions (e.g., familiarity). Thus, Aknin et al. (2013b) conducted a second, more tightly controlled experiment, in which participants were asked to reflect on a past spending experience that did or did not have a meaningful impact on another person ($n_{impact} = 56$, $n_{no impact} = 68$). To compare the emotional benefits of prosocial versus personal spending, a third group of participants was told to reflect on an experience in which they spent money on themselves ($n = 57$). As expected, people felt the happiest when they thought about a prosocial spending experience that made an impact on someone else.

To the best of our knowledge, only the two studies described above have directly manipulated impact and shown that this variable shapes the emotional benefits of prosocial spending. This points to a need for additional, well-powered experiments to confirm whether the happiness benefits of spending money on others are magnified when people can easily envision how their generosity is making a difference.

Relatedness

Aknin, Dunn, Sandstrom, & Norton (2013c) argued that giving to others should fulfill the fundamental need for relatedness when people feel a real sense of connection with those they are helping. In an early test of this hypothesis, Aknin et al. (2011) approached 79 individuals at the University of British Columbia and asked them to recall the last time they had spent approximately twenty

dollars on either someone to whom they were very close ($n = 39$) or someone to whom they were not very close ($n = 40$). Participants who recalled spending money on a close other (e.g., friends, family members) felt happier compared to participants who recalled spending money on someone less close (e.g., acquaintances, co-workers), suggesting that people derive more joy from giving when they feel more socially connected to their recipients.

Consistent with the notion that even minimal increases in social connection make a difference, another study showed that people derived more joy from donating to charity when solicitors revealed their own personal connection with the organization ($n = 41$) than when they did not ($n = 27$; Study 1 in Aknin et al., 2013c). In a similar vein, undergraduate students felt happier after sharing a windfall with one of their classmates when they could personally deliver money to that student ($n = 12$) than when researcher assistants made this transfer anonymously ($n = 12$; Study 2 in Aknin et al., 2013c). In a final study, participants derived more happiness from a \$10 Starbucks gift card when they were assigned to share the gift card with a friend during a visit to Starbucks ($n = 12$), rather than simply passing the gift card along to someone without accompanying them to the coffee shop ($n = 10$; Study 3 in Aknin et al., 2013c).

Taken together, these experiments provide preliminary evidence that people derive more joy when they feel a sense of connection to those they are helping. However, the use of small sample sizes across these studies underscores the need for further experimental work before strong conclusions can be drawn about the role of social connection in prosocial spending.

Autonomy

Weinstein & Ryan (2010) argued that giving to others should fulfill the fundamental need for autonomy when people feel that the decision to give was freely chosen, highlighting their ability to make their own choices. To test this notion, Weinstein & Ryan (2010) asked participants to distribute a total of \$25 between themselves and another participant. In one condition, participants were allowed to choose how to allocate the money ($n \approx 40$), whereas in the other condition they were told how to allocate the money ($n \approx 40$; Study 2). As expected, participants who were able to make their own choices felt happier the more they gave away—but this emotional benefit of sharing was eliminated among participants who did not have a choice. In a second experiment, a confederate asked participants for help with a small task, before adding that it was "entirely their choice whether to help or not" ($n \approx 34$) or saying that they "should help out" ($n \approx 34$; Study 4 in Weinstein & Ryan, 2010). After helping, people who were led to see their decision to help as freely chosen reported feeling happier than those who were told they should help.

Further evidence for the role of autonomy in unlocking the emotional benefits of giving comes from a six-week randomized controlled study with university students in the United States and South Korea (Nelson et al., 2014).

Participants were asked to perform acts of kindness every week (experimental condition) or to focus on their academic coursework (control condition). In both the experimental and control conditions, half of the participants received weekly messages designed to impart a sense of autonomy whereas the remainder did not receive any messages. As predicted, participants who practiced acts of kindness while receiving messages supporting their autonomy (n = 51) exhibited the greatest improvements in well-being compared to participants in all other conditions (ns = 50–59).

As far as we know, the three studies described above provide the only evidence to date that people reap greater emotional rewards from prosocial spending when their sense of autonomy is preserved. Thus, additional research is needed to confirm whether people feel happier from giving to others when they feel that their decision to give was freely chosen.

Overview of Experiments

In sum, the existing literature provides tentative evidence that the emotional benefits of prosocial spending are greater when the giving situation promotes competence, relatedness, and autonomy. However, the evidence for each of these key catalysts hinges on just a handful of studies, most of which had small sample sizes. Thus, the goal of the current research was to provide a set of conceptual replications that are appropriately powered to detect a moderate effect size, enabling clearer conclusions about the conditions under which prosocial spending promotes happiness.

In five experiments, we asked participants to reflect on previous experiences in which they spent money on others. In Study 1a, participants wrote about a time that they spent money on someone else in a way that did (or did not) make them feel happy. In Study 1b, participants wrote about the happiest prosocial spending experience they had ever had (which we compared with their most recent prosocial spending experience). If past research and theorizing is correct, then people should report that their happy giving experiences were marked by elevated levels of perceived impact, social connection and perceived choice.

Next, we examined each of these variables in turn, manipulating perceived impact (Study 2), social connection (Study 3), and perceived choice (Study 4), respectively. First, we examined the effect of perceived impact by comparing how people felt after spending money on someone else when it did (vs. did not) make a real difference for the recipient. Then, we assessed the effect of social connection by comparing how people felt after spending money on someone else when it did (vs. did not) make them feel connected to the person or cause they were helping. Finally, we tested the effect of perceived choice by comparing how people felt after spending money on someone else when they did (vs. did not) have a choice about whether to help. We predicted that participants would report higher levels of positive affect when they were able to see how their generosity had made an impact, when they felt a sense of connection

to those they were helping, and when they felt that the decision to help was freely chosen.

Although most studies on prosocial spending are performed using between-subjects designs, we used a within-subjects design to maximize our power to detect a moderate effect size. Of course, a potential limitation of using a within-subjects design is that participation in one condition may affect performance in another. Thus, across our five experiments, we assessed whether the effect of our manipulation varied by order before conducting the rest of our analyses.

Study 1
Overview
In Studies 1a and 1b, our central goal was to examine the features that distinguish between prosocial spending experiences that yield more (vs. less) happiness. If previous research is correct, then prosocial spending experiences that produce higher levels of happiness should be marked by relatively greater perceived impact, choice, and social connection.

Study 1a Methods
Participants
One hundred and one workers from Amazon MTurk participated in our study in exchange for $2. In light of recent concerns about bots on MTURK (e.g., Bai, 2018), two trained research assistants independently assessed each participant on their likelihood of being a bot and their compliance with instructions, using the following questions:

- *In your opinion, is this participant more likely to be a bot or a human-being?*
- *Did this participant describe two specific experiences that involved spending money on someone else, and were the two experiences different from each other?*

Inconsistencies were discussed between the two research assistants (see **Table 1** for inter-rater reliability). Participants who responded in ways that did not resemble a human-being, who did not describe two specific and distinct experiences in which they spent money on someone else, or who submitted more than one response were excluded from analysis. In total, we excluded and replaced 18 participants (see **Table 2** for demographics).

Procedure
Participants provided their informed consent before completing our study. All participants wrote about two recent experiences in which they spent money on another person or cause. In counterbalanced order, participants were asked to describe an experience that made them feel happy (*happy condition*), and an experience that did not make them feel happy (*unhappy condition*).

Immediately after describing each spending experience, participants completed our survey; our full survey can be found at http://tinyurl.com/y6fheszf and a complete list of measures and scale reliabilities can also be found in Table S1 and **Table 3**, respectively. We first asked

Table 1: Inter-rater Reliabilities.

Criteria	Study 1a	Study 1b	Study 2	Study 3	Study 4
Bot[a]	1	1	.75	.62	1
Adherence to Instructions[b]	.90	.96	–	–	–
Specific Experiences[c]	–	–	.84	.80	.89
Different Experiences[d]	–	–	.89	.86	1
Overall Exclusion[e]	.90	.96	.98	.76	.90

Note: All reported values are correlation coefficients (*r*) between coder 1 and coder 2.
[a] Agreement for: "In your opinion, is this participant more likely to be a bot or a human-being?"
[b] Agreement for: "Did this participant describe two specific experiences that involved spending money on someone else, and were the two experiences different from each other?"
[c] Agreement for: "Did the participant describe a specific experience in which they spent money on others?"
[d] Agreement for: "Did the participant describe different experiences in the two conditions?"
[e] Agreement that a participant should be excluded from analysis (overall).

Table 2: Demographics.

	Study 1a	Study 1b	Study 2	Study 3	Study 4
N	101	100	100	100	100
Age					
Mean	34.97	38.61	38.74	35.93	34.56
SD	10.41	11.37	10.27	10.25	8.95
Gender					
Female	40.6%	44%	47%	56%	43%
Male	59.4%	56%	53%	44%	57%
Ethnicity					
Caucasian	80.2%	76%	61%	79%	84%
African American	6.93%	9%	14%	11%	3%
East Asian	4.95%	4%	7%	4%	2%
Southeast Asian	1%	2%	4%	–	2%
Hispanic or Latino	5.94%	5%	7%	3%	5%
Mixed or Other	1%	4%	6%	3%	2%

Table 3: Scale Reliabilities (Cronbach's Alpha).

Measure	Study 1a		Study 1b		Study 2		Study 3		Study 4	
	Unhappy Condition	Happy Condition	Recent Condition	Lifetime Condition	Low Impact	High Impact	Low Connect	High Connect	Low Choice	High Choice
Positive Affect	.94	.91	.90	.84	.96	.92	.95	.90	0.96	0.93
Negative Affect	.83	.89	.88	.91	.92	.84	.93	.87	0.89	0.90
Social Connection	.90	.90	.82	.86	–	–	.87	.89	–	–
Closeness to Recipient[a]	.90	.95	.93	.93	–	–	.92	.91	–	–
Perceived Impact	.93	.95	.93	.93	.96	.93	–	–	–	–

[a] From Dibble, Levine, & Park (2011).

participants to report how much money they spent on a scale from 1 (*less than $5*) to 7 (*$501 or more*) and to report when the experience had occurred on a scale from 1 (*Today*) to 5 (*Over a year ago*).

Positive and negative affect
Next, to confirm that our manipulation was successful, we asked participants to complete the 12-item Scale of Positive and Negative Experiences (SPANE; Diener et al. 2009) that measured how much they felt six positive emotions (e.g., "Contented") and six negative emotions (e.g., "Bad") on a scale from 1 (*Not at all*) to 7 (*Very*). Then, we measured our key outcomes of interest.

Autonomy
On the 4-item Daily Autonomy Scale (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000), participants rated the extent to which their decision to give was motivated by an external ("something about the external situation forced me to do it"), introjected ("I made myself do it, to avoid anxiety or guilt"), identified ("interesting or not, I felt that it expressed my true values"), and intrinsic reason ("I did it purely for the interest and enjoyment in doing it") on a scale from 1 (*Not at all*) to 7 (*Completely*), allowing us to capture perceived choice.[1]

Impact
To capture perceived impact, we asked participants to indicate how much they felt that their contribution had made a meaningful impact on the recipient of their generosity on a scale from 1 (*Strongly disagree*) to 7 (*Strongly agree*) using 5-items (e.g., "My actions made a significant difference for the recipient") from the perceived prosocial impact scale in Aknin et al. (2013b).

Social connection
To assess social connection, we asked participants to report how socially connected they felt after the giving experience on a scale from 1 (*Strongly disagree*) to 7 (*Strongly agree*) using 8-items (e.g., "I felt like I was able to connect with others") from the Social Connection Scale-Revised (SCS-R; Lee, Draper, & Lee, 2001). As an additional measure of social connection, we presented participants with a set of overlapping circles marked "Self" and "Other" and asked participants to choose the diagram that best represented their feelings of closeness with their recipient using Aron, Aron, & Smollan's (1992) single-item Inclusion of Others in the Self-Scale. Finally, participants reported how close they felt to the recipient after the giving experience on a scale from 1 (*Strongly disagree*) to 7 (*Strongly agree*) using 4-items (e.g., "My relationship with the recipient was close") adapted from Dibble, Levine, & Park (2011), as well as completing demographic items and several other tertiary measures.

Study 1a: Results
Covariates and Analytic Strategy
Participants reported spending significantly more money in the happy condition ($M = 4.48$, $SD = 1.84$; or roughly $21–$50) compared to the unhappy condition ($M = $

3.81, $SD = 1.96$; or roughly $21–$50), $F(1,100) = 8.81$, $p = .004$. Thus, we included amount of money spent as a time-varying covariate in all of our analyses. To do so, we conducted a repeated-measures analysis of variance under a multi-level framework in which conditions (level-1) were nested under participants (level-2); we treated all predictors as fixed effects and allowed only the intercept to vary as a random effect at the participant-level. Because research on how to report effect sizes for multilevel models is still in its infancy, effect sizes estimates were calculated using more traditional approaches. Following Westfall's (2016) recommendations, we computed the classic Cohen's d for each of our comparisons using raw means and standard deviations. For readers who want effect sizes that adjust for our covariate (e.g., amount of money spent), we also calculated the classic Cohen's d using adjusted means. Finally, for readers who want estimates that are specific to repeated-measures designs, we also report Cohen's d_z for all of our comparisons.

Manipulation Check
Our manipulation was successful. Participants reported feeling higher levels of positive affect in the happy condition ($M_{adj} = 5.62$, $M_{raw} = 5.64$, $SD = 1.25$) compared to the unhappy condition ($M_{adj} = 1.72$, $M_{raw} = 1.70$, $SD = 0.99$), $F(1, 199) = 587.57$, $p < .001$. Participants also reported significantly lower levels of negative affect in the happy condition ($M_{adj} = 1.20$, $M_{raw} = 1.22$, $SD = 0.58$) than in the unhappy condition ($M_{adj} = 3.82$, $M_{raw} = 3.80$, $SD = 1.37$), $F(1, 199) = 303.47$, $p < .001$.

Order Effects
The effect of condition on perceived choice varied by order, $F(1, 99) = 6.97$, $p = 0.01$. Thus, to assess the effect of condition on perceived choice, we took the observations from the first condition that each participant completed and conducted an independent-measures ANOVA with condition as the independent variable and perceived choice as the dependent variable ($n_{happy} = 51$; $n_{unhappy} = 50$). We used a repeated-measures ANOVA to conduct all of our remaining analyses as there was no significant interaction between order and condition on the rest of our outcomes (see **Table 4**).

Key Outcomes
For all of our studies, we report the average number of characters that were written by participants, and provide examples of how they responded to each prompt in **Table 5**. As expected, there were significant differences in perceived choice, perceived impact and social connection between the happy and unhappy condition. Participants reported higher levels of perceived choice in the happy condition ($M_{adjusted} = 6.95$, $M_{raw} = 6.98$, $SD = 7.31$) compared to the unhappy condition ($M_{adjusted} = -3.09$, $M_{raw} = -3.12$, $SD = 8.96$), $F(1,98) = 38.25$, $p < .001$. Similarly, participants perceived more impact in the happy condition ($M_{adjusted} = 5.20$, $M_{raw} = 5.32$, $SD = 1.40$) compared to the unhappy condition ($M_{adjusted} = 3.40$, $M_{raw} = 3.28$, $SD = 1.66$), $F(1, 104) = 106.86$, $p < .001$. Finally, participants reported

Table 4: Order Effects Across Studies.

Outcome	Study 1a		Study 1b		Study 2		Study 3		Study 4	
	F	*p*	*F*	*p*	*F*	*p*	*F*	*p*	*F*	*p*
Positive Affect	–	–	–	–	0.02	.88	0.13	.72	0.77	.38
Negative Affect	–	–	–	–	0.23	.63	1.73	.19	1.01	.32
Impact	1.13	.29	3.40	.07	–	–	–	–	–	–
Social Connection	0.04	.85	0.56	.46	–	–	–	–	–	–
Perceived Choice	6.97	.01	0.34	.56	–	–	–	–	–	–
Closeness to Recipient										
Dibble, Levine, & Park (2011)	0.47	.50	0.89	0.35	–	–	1.99	.16	–	–
IOS	0.42	.52	3.56	0.06	–	–	0.03	.85	–	–

Note: Observed *F*-statistics and *p*-values for interactions between condition and order. A significant interaction term indicates that the effect of condition varied with the order in which participants completed the two writing prompts.

Table 5: Descriptive Results Across Studies.

Study	Condition	Mean Characters (SD)	Example
1a	Unhappy	428.75 (189.55)	I donated to a charity at the supermarket. It was a charity that had to do with helping feed children. I felt pressured into donating from the cashier. I donated because she kept pushing it and gave me a rude look. I eventually consented and donated a few dollars. I was unhappy, though, because I felt pressured into doing it and eventually found out the charity wasn't very good.
	Happy	395.29 (133.83)	I donated money to a charity that help dig wells in Africa and I was very pleased because they have explained how much was needed to build one well and I felt satisfied how much closer my donation contributed towards another. I felt happy because the guy who promoted the charity was very reputable and spent time himself in Africa and exposed himself to many diseases and I felt good donating to a reputable place.
1b	Recent	328.76 (131.88)	I think about a few months ago I went to the grocery store to get groceries and they were doing a charity for St. Judes where you could donate a dollar after you're done being ringed up. So I did and they gave me a little paper to sign and they put it up at the register on the wall along with other people who donated.
	Lifetime	410.64 (202.54)	I was able to give money to a pet shelter. The shelter was able to keep going and did not have to be shut down. I was thrilled that I could help animals get a chance at a new home. The animals were available to interact with. I received stories about how the animals I interacted with turned out. They were all placed in happy homes.
2	Low impact	352.24 (143.01)	I signed up for a monthly donation for the Humane Society. Every month I would get a charge on my credit card that reminded me that I was donating, but I did not know what my donation personally did. I did not know what amount of money was spent on administrative costs and what amount was actually spent on charity, and I also did not know what that charity entailed. The money could have been better spent if I just donated it to a local organization or for one local animal, in my opinion. I stopped the monthly donation for this reason.
	High impact	381.93 (163.83)	I spent money through our church group for missionaries serving in impoverished third world countries. We received pictures and information on how the beneficiaries of the donations were doing and it felt good that they were able to obtain food, clothing and shelter and were able to get an education.
3	Low connection	350.06 (176.31)	A time I spent money to help a cause and it did not make me feel a sense of social connection was when I was at the supermarket and the cashier asked me to make a donation for charity. It's so easy to just say yes in this situation and doing so didn't make me feel connected to the cause, in fact, I don't even remember what the cause was.
	High connection	383.61 (191.14)	I give a monthly amount to a young child in Ethiopia. It began about 2 years ago when I wanted to become involved with a charity in Africa. The child messages me every month and is extremely grateful for the relief we provide her. It's incredibly rewarding as we can see her attending school and receiving immunizations.

(Contd.)

Study	Condition	Mean Characters (SD)	Example
4	Low choice	330.17 (154.24)	I completed a survey through Mturk, that gave me a five dollar bonus, and instructed me to pick one of two charities provided to give it to. I wasn't allowed to keep it for myself, pick the charity I would actually donate to, and was forced into donating it to an organization I had never heard of. It was annoying that I didn't know more about them, as they could have been a bad group to donate to.
	High choice	318.64 (164.19)	I last spend money to help another person when a friend of mine didn't have enough money to pay their rent so I covered the amount that they couldn't pay for them. They have helped me out in the past so I felt that it was only right for me to help when they were in need. It was entirely my choice, and I made it because I care about this person.

Table 6: Study 1a: Means, Standard Deviations and Effect Sizes.

Outcome	Happy Condition		Unhappy Condition		d_{raw} ($d_{adjusted}$)	dz
	Means[a]	SD	Means[a]	SD		
Money Spent	4.48	1.84	3.81	1.96	0.35	0.30
Positive Affect	5.64 (5.62)	1.25	1.70 (1.72)	0.99	3.49 (3.46)	2.35
Negative Affect	1.22 (1.20)	0.58	3.80 (3.82)	1.37	2.45 (2.49)	1.74
Perceived Choice	6.98 (6.95)	7.31	−3.12 (−3.09)	8.96	1.24 (1.23)	N/A
Impact	5.32 (5.20)	1.40	3.28 (3.40)	1.66	1.33 (1.17)	1.06
Social Connection	5.63 (5.60)	1.16	3.60 (3.63)	1.35	1.61 (1.57)	1.26
Closeness to Recipient						
Dibble, Levine, & Park (2011)	4.53 (4.40)	1.83	2.68 (2.81)	1.66	1.06 (0.91)	0.93
IOS	4.45 (4.36)	1.89	2.30 (2.38)	1.69	1.20 (1.10)	0.92

Note: Cohen's *d* (raw) is calculated with the difference between raw means. Cohen's *d* (adjusted) is calculated with the difference between means that adjust for amount of money spent as a covariate. Cohen's *dz* is calculated by dividing the mean difference score by its standard deviation; a difference score was calculated for each participant by subtracting their score in the unhappy condition from their score in the happy condition; the difference does not adjust for amount of money spent as a covariate.
[a] Adjusted means reported in parentheses.

feeling more socially connected on the SCS-R in the happy condition ($M_{adjusted}$ = 5.60, M_{raw} = 5.63, SD = 1.16) than in the unhappy condition ($M_{adjusted}$ = 3.63, M_{raw} = 3.60, SD = 1.35), $F(1, 103.94)$ = 147.39, $p < .001$. This is consistent with results on feelings of closeness; participants reported feeling closer to recipients in the happy (vs. unhappy) condition on the IOS, $F(1, 103.45)$ = 71.55, $p < .001$, and on Dibble et al.'s (2011) scale, $F(1, 102.46)$ = 67.88, $p < .001$ (see **Table 6** for all means, standard deviations, and effect sizes).

Study 1a Discussion
In Study 1a, we found initial evidence that happier prosocial spending experiences were indeed marked by greater levels of perceived choice, perceived impact and social connection. Of course, in interpreting our findings, it is important to recognize that we contrasted a happy prosocial spending experience with an experience that did not make participants feel happy. Thus, the effects we observed might stem from properties of unusually lackluster prosocial spending experiences. To capture the more positive end of the spectrum, we asked participants in Study 1b to write about the happiest prosocial spending experience of their lives (versus their most recent prosocial spending experience).

Study 1b Methods
Participants
A hundred workers from Amazon MTurk completed the study in exchange for $2. The exclusion strategy was identical to Study 1a (see **Table 1** for inter-rater reliability). In total, we excluded and replaced 45 participants[2] (see **Table 2** for demographics).

Procedure
The procedure was almost identical to Study 1a. The only difference was in the kind of experiences participants were asked to recall. In counterbalanced order, participants were asked to describe an experience of spending money on others that happened most recently (*recent condition*), and an experience of spending money on others that made them feel the happiest across their entire lifetime (*lifetime condition*). Our full survey can be found at https://tinyurl.com/y6yd8m7o.

Study 1b: Results
Covariates
Participants recalled spending more money in the lifetime condition (M = 4.92, SD = 1.73; or roughly $51–$100) than in the recent condition (M = 3.73, SD = 1.80; or roughly $21–$50),

Table 7: Study 1b: Means, Standard Deviations and Effect Sizes.

Outcome	Lifetime Condition		Recent Condition		d_{raw} $(d_{adjusted})$	dz
	Means[a]	SD	Means[a]	SD		
Money Spent	4.92	1.73	3.73	1.80	0.67	0.54
Positive Affect	5.81 (5.75)	0.97	5.04 (5.10)	1.35	0.66 (0.55)	0.61
Negative Affect	1.35 (1.32)	0.78	1.47 (1.49)	0.87	0.15 (0.21)	0.16
Perceived Choice	8.86 (8.60)	6.44	6.20 (6.46)	6.96	0.40 (0.32)	0.38
Impact	5.62 (5.41)	1.15	4.90 (5.11)	1.46	0.55 (0.23)	0.49
Social Connection	5.70 (5.64)	0.99	5.32 (5.38)	0.98	0.39 (0.26)	0.41
Closeness						
Dibble, Levine, & Park (2011)	4.79 (4.53)	1.73	3.64 (3.90)	1.86	0.64 (0.35)	0.58
IOS	4.56 (4.36)	1.85	3.97 (4.17)	1.98	0.31 (0.10)	0.33

Note: Cohen's *d* (raw) is calculated with the difference between raw means. Cohen's *d* (adjusted) is calculated with the difference between means that adjust for amount of money spent as a covariate. Cohen's *dz* is calculated by dividing the mean difference score by its standard deviation; a difference score was calculated for each participant by subtracting their score in the recent condition from their score in the lifetime condition; the difference does not adjust for amount of money spent as a covariate.

[a] Adjusted means reported in parentheses.

$F(1,99) = 29.62$, $p < .001$. Thus, we included amount of money spent as a time-varying covariate in all of our analyses.

Manipulation Check

Our manipulation was successful. Participants reported higher levels of positive affect in the lifetime condition ($M_{adjusted} = 5.75$, $M_{raw} = 5.81$, $SD = 0.97$) than in the recent condition ($M_{adjusted} = 5.10$, $M_{raw} = 5.04$, $SD = 1.35$), $F(1, 110.82) = 22.85$, $p < .001$. Participants in the lifetime condition also reported lower levels of negative affect ($M_{adjusted} = 1.32$, $M_{raw} = 1.35$, $SD = 0.78$) compared to those in the recent condition ($M_{adjusted} = 1.49$, $M_{raw} = 1.47$, $SD = 0.87$), $F(1, 107.65) = 4.38$, $p = .04$.

Order Effects

For all of our outcomes, the effect of condition did not vary by the order (see **Table 4**). Thus, we used repeated-measures ANOVA's to conduct all of our analyses.

Key Outcomes

There were significant differences in perceived choice, perceived impact and social connection between the lifetime condition and the recent condition. Participants reported higher levels of perceived choice in the lifetime condition ($M_{adjusted} = 8.60$, $M_{raw} = 8.86$, $SD = 6.44$) than in the recent condition ($M_{adjusted} = 6.46$, $M_{raw} = 6.20$, $SD = 6.96$), $F(1, 110.96) = 7.77$, $p = .006$. Likewise, participants perceived more impact in the lifetime condition ($M_{adjusted} = 5.41$, $M_{raw} = 5.62$, $SD = 1.15$) than in the recent condition ($M_{adjusted} = 5.11$, $M_{raw} = 4.90$, $SD = 1.46$), $F(1,111.51) = 4.72$, $p = 0.03$. On the SCS-R, participants reported feeling more socially connected in the lifetime condition ($M_{adjusted} = 5.64$, $M_{raw} = 5.70$, $SD = 0.99$) than in the recent condition ($M_{adjusted} = 5.38$, $M_{raw} = 5.32$, $SD = 0.98$), $F(1, 109.22) = 6.86$, $p = 0.01$. The effect of condition on closeness to recipients was mixed. When closeness to recipient was measured using Dibble et al.'s (2011) scale, participants reported feeling closer to recipients in the lifetime condition ($M_{adjusted} = 4.53$, $M_{raw} = 4.79$, $SD = 1.73$) compared to the recent condition ($M_{adjusted} = 3.90$, $M_{raw} = 3.64$, $SD = 1.86$), $F(1, 111.27) = 10.70$, $p = .001$. In contrast, there was no difference between the two conditions when closeness to recipients was measured using the IOS, $F(1, 108.96) = 1.18$, $p = .28$ (see **Table 7** for all means, standard deviations, and effect sizes).

Study 1b Discussion

Consistent with our findings from Study 1a, people reported higher levels of perceived choice, perceived impact, and social connection when they thought about the happiest prosocial spending experience in their lifetime than when they thought about their most recent prosocial spending experience. Taken together, Studies 1a and 1b suggest that happy (vs. less happy) prosocial spending experiences do indeed differ on the key dimensions identified in previous research. However, the design of Studies 1a&b does not enable strong causal inferences about the extent to which each key construct (e.g., impact) affects the degree of happiness people derive from spending money on others. Thus, in the pre-registered studies that follow, we manipulated each construct in turn (impact in Study 2; social connection in Study 3; and perceived choice in Study 4) and examined the consequences for happiness.

Study 2: Perceived Impact
Overview

In Study 2, we examined the role of perceived impact in shaping the emotional benefits of prosocial spending. We predicted that spending money on others would lead to higher levels of positive affect when givers are able to observe the impact that their spending had on recipients. We planned to collect a sample of $N = 100$ in order to detect a moderate effect ($d = .30$) in a repeated-measures design with 80% power; this effect size was selected based on what we considered to be the smallest effect of interest. The pre-registration can be found at http://tinyurl.com/y2eqyfz5.

Methods

Participants

A hundred workers from Amazon MTurk participated in exchange for $2 (see **Table 2** for demographics). Two trained research assistants assessed each participant on their likelihood of being a bot and their compliance with instructions, using the following questions:

- *In your opinion, is this participant more likely to be a bot or a human-being?*
- *Did the participant describe a specific experience in which they spent money on others?*
- *Did the participant describe different experiences in the two conditions?*

Inconsistencies were discussed between the two research assistants (see **Table 1** for inter-rater reliability). Participants who responded in ways that did not resemble a human-being, who did not describe a specific experience in which they spent money on someone else, who did not describe two different experiences, or who submitted more than one response were excluded from analysis. In total, we excluded and replaced 32 participants.

Procedure

Participants provided their informed consent before completing our study. All participants were asked to write about two recent experiences in which they spent money on another person or cause. In counterbalanced order, participants were asked to describe an experience in which they were able to see the difference that their generosity made (*high-impact condition*), and an experience in which they were unable to see the difference that their generosity made (*low-impact condition*).

Immediately after describing each spending experience, participants completed our survey. First, to measure our key outcome of interest, we asked participants to report how they felt after the experience. Next, to confirm the success of our manipulation, we asked participants to report the extent to which they felt that their actions had made a meaningful impact on the recipient of their generosity. Then, we asked participants to report how much money they had spent and when the experience had occurred. Finally, participants completed demographic items and other exploratory measures that are beyond the scope of the current paper. All of the measures included in this study were identical to the ones used in Studies 1a and 1b. Our full survey can found at http://tinyurl.com/yxeq5tta.

Results

Covariates

Participants reported spending more money in the high-impact condition ($M = 4.55$, $SD = 1.74$; roughly $51–$100) than in the low-impact condition ($M = 3.83$, $SD = 1.79$; roughly $21–$50), $F(1, 99) = 12.04$, $p < .001$. Following our pre-registered decision, we included amount of money spent on others as a time-varying covariate in all of our analyses.

Manipulation Check

Our manipulation was successful. Participants perceived greater impact in the high-impact condition ($M_{adjusted} = 5.71$, $M_{raw} = 5.80$, $SD = 1.17$) compared to the low-impact condition ($M_{adjusted} = 4.13$, $M_{raw} = 4.04$, $SD = 1.65$), $F(1,103.82) = 74.08$, $p < .001$.

Order Effects

The effect of condition on our main outcomes did not vary by order (see **Table 4**). Thus, we used a repeated-measures ANOVA to conduct all of our analyses.

Pre-registered Hypotheses

As predicted, participants reported higher levels of positive affect in the high-impact condition ($M_{adjusted} = 5.59$, $M_{raw} = 5.61$, $SD = 1.23$) than in the low-impact condition ($M_{adjusted} = 4.28$, $M_{raw} = 4.25$, $SD = 1.85$), $F(1, 104.43) = 42.71$, $p < .001$ (see **Table 8** for all means, standard deviations, and effect sizes).

Exploratory Analyses

On an exploratory basis, we examined whether the high- and low-impact conditions differed in negative affect. Consistent with the results in Studies 1a and 1b, participants reported lower levels of negative affect in the high-impact condition ($M_{adjusted} = 1.40$, $M_{raw} = 1.40$, $SD = 0.71$) compared to the low-impact condition ($M_{adjusted} = 2.01$, $M_{raw} = 2.01$, $SD = 1.41$), $F(1, 104.50) = 16.37$, $p < .001$.

Table 8: Study 2: Means, Standard Deviations and Effect Sizes.

Outcome	High-Impact Condition		Low-Impact Condition		d_{raw} ($d_{adjusted}$)	dz
	Means[a]	SD	Means[a]	SD		
Money Spent	4.55	1.74	3.83	1.79	0.41	0.35
Impact	5.80 (5.71)	1.17	4.04 (4.13)	1.65	1.23 (1.10)	0.92
Positive Affect	5.61 (5.59)	1.23	4.25 (4.28)	1.85	0.87 (0.83)	0.70
Negative Affect	1.40 (1.40)	0.71	2.01 (2.01)	1.41	0.55 (0.55)	0.42

Note: Cohen's *d* (raw) is calculated with the difference between raw means. Cohen's *d* (adjusted) is calculated with the difference between means that adjust for amount of money spent as a covariate. Cohen's *dz* is calculated by dividing the mean difference score by its standard deviation; a difference score was calculated for each participant by subtracting their score in the low-impact condition from their score in the high-impact condition; the difference does not adjust for amount of money spent as a covariate.
[a] Adjusted means reported in parentheses.

Study 2 Discussion

When asked to think about the last time they spent money to help another person or a cause, people reported higher levels of positive affect and lower levels of negative affect when they were able (vs. unable) to see the difference that their generosity had made. This is in line with previous research suggesting that people find spending money on others more gratifying when it fulfills their fundamental need for competence by reinforcing their capacity to take effective action in the world.

Study 3: Social Connection

Overview

In Study 3, we examined the role of social connection in amplifying the emotional benefits of prosocial spending. We predicted that spending money on others would lead to higher levels of positive affect when people feel a sense of social connection to the person or cause they are helping. We planned our sample size using the same power analysis from Study 2. The pre-registration can be found at http://tinyurl.com/yynzvnxh.

Methods

Participants

Participants were 100 workers from Amazon MTurk (see **Table 2** for demographics). Two trained research assistants independently assessed each participant using the same exclusion criteria from Study 2 (see **Table 1** for inter-rater reliability). In total, we excluded and replaced 20 participants.

Procedures

Participants provided their informed consent before completing our study. All participants were asked to write about two recent experiences in which they spent money on another person or cause. In counterbalanced order, participants were asked to describe an experience that made them feel a sense of social connection to the person or cause they were helping (*high-connection condition*), and an experience that did not make them feel this sense of connection (*low-connection condition*).

Immediately after describing each spending experience, participants completed our survey. As in Study 2, we first asked participants to report how they felt after the experience. Next, to assess whether our manipulation was successful, we asked participants to report how socially connected they felt after the spending experience and how they close they felt to the recipient(s) of their generosity. Then, participants reported how much money they spent and when the experience had occurred. Finally, participants completed demographic items and other exploratory measures that are beyond the scope of the current paper. All of the measures included in this study were identical to ones used in Studies 1 and 2. Our full survey can found at http://tinyurl.com/yxbhzkfx.

Results

Covariates

Participants reported spending more money in the high-connection condition ($M = 4.23$, $SD = 1.63$; roughly \$21–\$50) than in the low-connection condition ($M = 2.95$, $SD = 1.79$; roughly \$11–\$20), $F(1,99) = 39.35$, $p < .001$. Following our pre-registered decision, we included amount of money spent on others as a time-varying covariate in all of our analyses.

Manipulation Check

Our manipulation was successful. Participants reported feeling more socially connected in the high-connection condition ($M_{adjusted} = 5.94$, $M_{raw} = 6.02$, $SD = 1.00$) compared to the low-connection condition ($M_{adjusted} = 3.92$, $M_{raw} = 3.84$, $SD = 1.32$), $F(1,115.76) = 153.69$, $p < .001$.

Order Effects

The effect of condition on our main outcomes did not vary by order (see **Table 4**). Thus, we used a repeated-measures ANOVA to conduct all of our analyses.

Pre-registered Hypotheses

As predicted, participants reported higher levels of positive affect in the high-connection condition ($M_{adjusted} = 5.67$, $M_{raw} = 5.70$, $SD = 1.26$) than in the low-connection condition ($M_{adjusted} = 3.18$, $M_{raw} = 3.15$, $SD = 1.58$), $F(1, 115.66) = 170.83$, p < .001 (see **Table 9** for all means, standard deviations, and effect sizes).

Table 9: Study 3: Means, Standard Deviations and Effect Sizes.

Outcome	High-Connection Condition		Low-Connection Condition		d_{raw} $(d_{adjusted})$	dz
	Means[a]	SD	Means[a]	SD		
Money Spent	4.23	1.63	2.95	1.79	0.75	0.63
Social Connection	6.02 (5.94)	1.00	3.84 (3.92)	1.32	1.86 (1.73)	1.46
Positive Affect	5.70 (5.67)	1.26	3.15 (3.18)	1.58	1.78 (1.74)	1.47
Negative Affect	1.40 (1.31)	0.90	2.12 (2.21)	1.51	0.58 (0.72)	0.47

Note: Cohen's *d* (raw) is calculated with the difference between raw means. Cohen's *d* (adjusted) is calculated with the difference between means that adjust for amount of money spent as a covariate. Cohen's *dz* is calculated by dividing the mean difference score by its standard deviation; a difference score was calculated for each participant by subtracting their score in the low-connection condition from their score in the high-connection condition; the difference does not adjust for amount of money spent as a covariate.
[a] Adjusted means reported in parentheses.

Exploratory Analyses

We also examined whether the high- and low-connection condition differed in negative affect. Consistent with previous findings, participants reported lower levels of negative affect in the high-connection condition ($M_{adjusted}$ = 1.31, M_{raw} = 1.40, SD = 0.90) than in the low-connection condition ($M_{adjusted}$ = 2.21, M_{raw} = 2.12, SD = 1.51), $F(1, 115.45)$ = 31.40, $p < .001$.

Study 3 Discussion

In Study 3, people reported higher levels of positive affect and lower levels of negative affect when they thought about a prosocial spending experience that did (vs. did not) make them feel a sense of social connection to the person or cause they were helping. This is consistent with previous research suggesting that people find spending money on others more rewarding when it fulfills their fundamental need for relatedness.

Study 4: Perceived Choice

Overview

In Study 4, we assessed the role of perceived choice in shaping the emotional benefits of prosocial spending. We predicted that spending money on others would lead to higher levels of positive affect when people felt that their decision to give was freely chosen. We planned our sample size using the same power analysis from Study 2. The pre-reregistration can be found at http://tinyurl.com/yxjt9fw9.

Methods

Participants

Participants were 100 workers from Amazon MTurk (see **Table 2** for demographics). Two trained research assistants independently assessed each participant using the same exclusion criteria from Study 2 (see **Table 1** for inter-rater reliability). In total, we excluded and replaced 25 participants.

Procedures

Participants provided their informed consent before completing our study. All participants were asked to write about two recent experiences in which they spent money on another person or cause. In counterbalanced order, participants were asked to describe an experience in which they felt that it was entirely their choice whether to help (*high-choice condition*), and an experience in which they felt that they had no choice about whether to help (*low-choice condition*).

Immediately after describing each spending experience, participants completed our survey. As in our previous studies, we first asked participants to report how they felt after the experience. Next, to assess whether our manipulation was successful, we asked participants to indicate the extent to which their decision to give was motivated by intrinsic (vs. extrinsic) reasons. Then, participants completed measures identical to those used

in Studies 1–3. Our full survey can found at http://tinyurl.com/y43kdsuf.

Results

Covariates

The amount of money spent on others did not differ between the high- and low-choice condition, $F(1, 99) = 0.18$, $p = .67$. Following our pre-registered decision tree, we did not include amount of money spent as a time-varying covariate in any of our analyses.

Manipulation Check

Our manipulation was successful. Participants reported higher levels of perceived choice in the high-choice condition (M = 8.16, SD = 7.65) than in the low-choice condition ($M = -8.20$, $SD = 6.12$), $F(1, 198) = 278.7$, $p < .001$.

Order Effects

The effect of condition on our main outcomes did not vary by order (see **Table 4**). Thus, we used a repeated-measures ANOVA to conduct all of our analyses.

Pre-registered Hypotheses

As predicted, participants reported higher levels of positive affect in the high-choice condition (M = 5.21, SD = 1.45) than in the low-choice condition (M = 2.75, SD = 1.61), $F(1, 99)$ = 171.22, $p < .001$ (see **Table 10** for means, standard deviations, and effect sizes).

Exploratory Analyses

Participants also reported lower levels of negative affect in the high-choice condition (M = 1.35, SD = 0.78) than in the low-choice condition (M = 2.61, SD = 1.34), $F(1, 99)$ = 83.35, $p < .001$.

Table 10: Study 4: Means, Standard Deviations and Effect Sizes.

Outcome	High-Choice Condition		Low-Choice Condition		d^a	dz
	Means	**SD**	**Means**	**SD**		
Money Spent	4.12	1.76	4.02	2.01	0.05	0.04
Perceived Choice	8.16	7.65	–8.20	6.12	2.36	1.56
Positive Affect	5.21	1.45	2.75	1.61	1.61	1.31
Negative Affect	1.35	0.78	2.61	1.34	1.15	0.91

Note: Cohen's d (raw) is calculated with the difference between raw means. Cohen's d (adjusted) is calculated with the difference between means that adjust for amount of money spent as a covariate. Cohen's dz is calculated by dividing the mean difference score by its standard deviation; a difference score was calculated for each participant by subtracting their score in the low-choice condition from their score in the high-choice condition; the difference does not adjust for amount of money spent as a covariate.

[a] In Study 4, the amount of money spent on someone else or a cause did not vary by condition. Thus, no adjusted means were computed because amount of money spent was not included as a time-varying covariate during data analysis.

Study 4 Discussion

In Study 4, people reported higher levels of positive affect and lower levels of negative affect when they felt that their decision to spend money on others was freely chosen (vs. felt that they had no choice). This aligns with previous research suggesting that people feel happier from spending money on others when it fulfills their need for autonomy by maintaining their ability to make their own choices.

General Discussion

The present research provides the first set of appropriately powered, pre-registered studies examining the conditions that maximize the emotional benefits of prosocial spending. Consistent with past research and theorizing, we found that especially pleasurable giving experiences were marked by relatively high levels of perceived impact, social connection, and free choice (Studies 1a and 1b). Next, we manipulated each of these variables in turn. We found that participants reported higher levels of positive affect when they reflected on prosocial spending experiences that enabled them to see the difference their generosity made (Study 2) and that made them feel a sense of social connection to the person or cause they were helping (Study 3). Similarly, participants reported higher positive affect when they felt that the decision to help was entirely their choice (Study 4). These findings are broadly consistent with predictions from self-determination theory, which posits that human well-being depends on the satisfaction of the fundamental needs for competence, relatedness, and autonomy.

Although these findings are not especially surprising, they are important from both a basic and applied perspective. In the wake of the replicability crisis, researchers are devoting increased attention to interpreting inconsistent findings and failed conceptual replications. Our findings suggest that there is a higher chance of observing a null effect of prosocial spending on happiness in studies that neglect the role of impact, social connection, and choice. Of course, giving experiences that offer little opportunity for impact, connection, or choice may still make people happier than not giving at all. However, we would expect the beneficial effects of such giving experiences to be relatively small.

From an applied perspective, the present findings may be valuable for charitable organizations and policymakers who want to encourage people to make charitable donations. To the extent that people are more likely to engage in behaviors they find pleasurable, amplifying the emotional payoff of giving may increase charitable giving over time. Yet, commonly used solicitation strategies may undermine people's sense of impact, connection, and choice. For instance, when asked to describe a low-impact prosocial spending experience, one participant wrote about their experience of donating to a Hurricane Relief Fund and how they could not tell what the end result of their contributions really were or how much of their money actually went to help others. Similarly, when asked to describe a low-connection spending experience, one participant described making a donation for hurricane relief while checking out at a grocery store;

they wrote about feeling no sense of connection because both the recipients of the aid and the cashier making the request were strangers. When asked to write about a low-choice giving experience, one person wrote, "I felt pressure to give to an international children's charity by way of a person standing outside my local grocery store. I was tired and not feeling well, and this person was very gregarious and in your face, but also pleasant. I felt like the only way to extract myself from the situation was to give to the charity (which is a good cause anyway)." We noticed that it was common for participants to describe giving at grocery stores as unsatisfying, underscoring the potential value of considering how to increase feelings of impact, connection, and choice in this common giving context.

Rather than breaking new ground, the goal of the present work was to apply current best practices in order to confirm prior research findings and theorizing. In order to conduct a comprehensive test of past work on the key catalysts that turn good deeds into good feelings, we relied on recollection paradigms, in which participants recalled their own previous experiences. As well as enabling online data collection, this methodological approach allowed us to capture real world spending experiences, in which people sacrificed their own money to help others.

An inherent downside of relying on recollections is that participants may mis-remember their own experiences and feelings and apply their own causal theories about how they *should* have felt (e.g., "I spent money on others in a way that made a big impact so I should feel happy about it"). This issue is particularly important to consider given that we used a within-subject design; when participants read our second prompt and saw that it was similar to the preceding prompt on all but our critical dimension, it is possible that they might have guessed our hypothesis and adjusted their responses to the second questionnaire accordingly. In contrast to this possibility, however, we found very similar effects of our manipulations when we conducted between-subjects analyses looking only at participants' responses to the first prompt they completed (see Text S1). Although we cannot rule out the possibility that participants' responses were influenced by their own causal theories, the similarity between the within-subjects and between-subjects analyses points to the conclusion that our effects were not driven primarily by participants' causal theories.

Furthermore, when participants recall past spending experiences, it is possible that the experiences are not equivalent on all dimensions other than the manipulated dimension. Indeed, in all but one study, participants reported spending more money on others in one condition over the other. Although we were able to include amount of money spent as a covariate, there might be other differences between our conditions that contributed to the effects we observed.

A related limitation is that we included amount of money spent as an ordinal—rather than continuous—covariate in all of our analyses. Although we used this approach intentionally because it can be challenging for participants to provide an exact estimate of how much they spent in the past, this approach also increases

the possibility of bias and measurement error. Future research could test whether the same effects emerge using other methodologies (e.g., daily diary design) that involve a shorter delay between time of spending and recall.

The present research was conducted with a North American sample from MTurk and, thus, it is unclear whether impact, connection, and choice play a similar role in other cultures. Future research could test the cultural boundaries of the present findings. In addition, researchers could also build on the present research by testing the relative contributions of impact, connection and choice, and how different combinations of the three moderators influence how people feel after spending on others. It would also be interesting to identify other moderators that are not addressed in our studies. For example, do people feel happier when they give larger (vs. smaller) sums of money, when they give experiences (vs. material possessions), and when they give to causes (vs. specific individuals)?

We believe that the existing evidence for the moderators examined in the present research is now strong enough to warrant large-scale applied tests in real world contexts. For example, a charitable organization could design two ad campaigns or novel initiatives that differ in the extent to which they provide donors with opportunities to see the impact of their generosity, to connect with recipients, or to freely choose how or whether to donate. By using open science practices to confirm that impact, connection, and choice catalyze the emotional benefits of prosocial spending, the present research provides a solid foundation for real-world interventions that can maximize a virtuous circle between giving and happiness.

Data Accessibility Statement
All data, materials and program syntax can be found on OSF. For Study 1a and b, please visit http://tinyurl.com/y5m4ydfl. For Study 2, please visit http://tinyurl.com/y3c69rh7. For Study 3, please visit http://tinyurl.com/yxff37av. For Study 4, please visit http://tinyurl.com/y4vlw9e2.

Notes
[1] We calculated a summary autonomy score using Reis et al.'s (2000) guidelines. Each reason was given the following weights: intrinsic (+2), identified (+1), introjected (−1), and external (−2). Thus, autonomy scores ranged from −12 to 12.

[2] Of the 45 participants that were excluded, 26 failed to follow instructions (e.g., did not describe experiences that involved spending money on others), 15 described the same experience in both conditions, and 5 made multiple submissions from the same I.P. address.

Additional Files
The additional files for this article can be found as follows:

· **Table S1.** List of Measures. DOI: https://doi.org/10.1525/collabra.254.s1
· **Text S1.** Between-subject Analyses. DOI: https://doi.org/10.1525/collabra.254.s2

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