Belief in Zero-Sum Happiness: Relationships to Prosocial Behavior and Well-Being

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Abstract

Does helping others deplete our own well-being, or replenish it? Empirical answers to this question are mixed, but instead, we explore the belief about it, this belief's relation to happiness, prosociality, and well-being. We develop a novel scale to capture Belief in Zero Sum Happiness (BZSH): a belief that increasing others' happiness comes at a cost of one's own. In three observational studies, we show that it is distinct from a measure of general zero-sum beliefs and demonstrate that people who believe happiness is zero sum act less prosocially, which in turn predicts lower subjective happiness (Studies 1a-1c; $N = 1176$). Next, in a set of experiments, people induced to believe happiness is win-win (vs. zero-sum) donated more to charity and reported greater subsequent happiness (Studies 2a-2c; $N = 2018$). These findings suggest that when people believe happiness is zero-sum, they deprive themselves of a key to well-being: helping others.

On your way to the office, you see a person in distress. It is clear that your help will alleviate them of their anguish, but you are not quite sure how this will affect you. Simulating the scenarios in your mind, you could see how exerting effort and time to help them will take a toll on your own well-being. But you could also see how elevating others from hardship will cheer you up, rather than put you down. Well, a belief in one outcome over another will likely determine your behavior—and by extension—your ensuing happiness. People encounter situations such as this every day, but if they believe that one person's gain is another person's loss, they will be deterred from helping those in need. And if that is the case, their belief in happiness as zero-sum, rather than win-win, prevents them of the opportunity to enjoy a potential benefit of helping others. In that sense, not only are others paying a price, but so do the believers themselves; a lose-lose, rather than win-win, outcome.

It turns out that both zero-sum and win-win beliefs of happiness can be true, as the literature on the personal benefits of helping behavior is rather nuanced (for review, see Aknin, Whillans, Norton, & Dunn, 2019). A meta-analysis of forty empirical papers found that volunteering is associated lower rates of depression, higher satisfaction with life, and higher well-being (Jenkinson, Pickens… & Richards, 2013). Later in life, older individuals who volunteer in assistance to others tend to have a higher quality of life (Wheeler, Gorey, & Greenblatt, 1998). However, the correlational nature of these studies does not rule out the possibility that those who help others are already happier. For example, happiness at a given timepoint has ripple effects on helping behavior online at a later timepoint (Erreygers, Vandebosch, Vranjes, Baillien, & De Witte, 2019). Experimental designs can help untangle this tension.

Experimental evidence has been inconclusive as well. Students randomly assigned to volunteer in the field, over twelve weeks, were not found to experience higher well-being than waitlisted students (Whillans et al., 2016). As Whillans *et al.* (2016) note, experimentally inducing well-being in healthy and relatively wealthy participants is a tall task. As a proxy for helping behavior, the effects of spending money on others vs. oneself has been tested as well (Dunn, Aknin, & Norton, 2008). Spending money on others predicts greater happiness in the short term (Dunn, Aknin, & Norton, 2008; Aknin, Dunn, Proulx, Lok, & Norton, 2020), but recalling prosocial spending does not (Aknin et al., 2020). And in one study, people reported reduced happiness four weeks after prosocial spending versus keeping money for personal use (Falk & Graeber, 2020).

If understanding the benefits of prosocial behavior is hard for researchers, it must be even harder for individual actors. People often mis-forecast their own happiness (for review, see Diener & Oishi, 2005), and someone who believes helping others would cost them might avoid prosocial behavior even if it would actually improve their well-being. For instance, Dunn *et al.* (2008) found that participants who spent money on others reported greater positive affect than those who spent money on themselves. But when asked to forecast their post-spending happiness, participants thought they would benefit more from personal—rather than prosocial—spending. From where do these forecasting errors arise? One possibility is that they reflect the way people think about spending. Those who think about it in abstract terms forecast greater happiness than those who think about it in concrete terms (Aknin, Van Boven, & Johnson-Graham, 2015). Here, we explore a novel, second possibility: that prosocial choices depend on how people think about happiness.

Some individuals might view happiness as a *zero-sum* resource. Zero-sum thinking is a worldview in which one's gains are necessarily another's losses (von Neumann & Morgenstern, 1944). It can be thought of in two ways. One way in which zero-sum thinking has been studied is as a social axiom (Rozycka-Tran, Boski, & Wojcizke, 2015). It relates to how people see social relations, intergroup dynamics, and negotiations. Another way in which zero-sum thinking has been studied is through specific contexts and transactions (e.g., racial minorities gaining social capital at the expense of the majority; Brown & Jacoby-Senghor, 2022). Here, we focus on the former.

This belief is quite pervasive. For example, in the classroom, where grades are an unlimited resource, students still compete as if grades were artificially curved (Meegan, 2010). In negotiations, people often portray a "fixed-pie" bias, even when the terms of the negotiation allow for an outcome that benefits both sides (Bazerman, 1983). When negotiation partners see outcomes of their interaction as zero-sum, they ignore points of mutual benefit, and are more likely to produce "lose-lose outcomes" that are suboptimal for both parties (Thompson & Hrebec, 1996). Indeed, "unfixing" that bias leads to greater joint outcomes (de Dreu, Koole, & Steinel, 2000). Outside of a negotiation context, zero-sum thinking has been studied as a cross-cultural social axiom. A large-scale survey across 37 countries found that it is negatively associated with trust and self-esteem across individuals, and positively associated with cynicism across nations (Rozycka-Tran et al., 2015).

Here we examine another form of zero-sum thinking: *belief in zero-sum happiness* (BZSH). Although it has not received much attention to date, existing work suggests this belief might have deleterious effects. For example, those who believe in fixed amounts of happiness—rather than happiness as an unlimited resource—were rated less favorably by their peers, took

advantage of less positive opportunities, and mis-forecasted their own happiness (Koo & Suh, 2007). Similar beliefs also help explain the relationship between poor sleep quality and reduced life satisfaction (Shin & Kim, 2018). A transactional view of happiness was examined as well. Seeing happiness as driven by relationships (vs. material goods) is predictive of greater life satisfaction (Bojanowska & Zalewska, 2016), and associating happiness with social words is related to greater reported happiness (Shin, Suh, Eom, & Kim, 2018). Within the literature, though, the role of prosocial behavior in the relationship between BZSH and well-being remains unclear.

We conceptualize BZSH as an amalgamation of two similar, but distinct, zero-sum beliefs. On one hand, people may believe that happiness is a universally limited resource (Koo & Suh, 2007). This is akin to the view of belief in zero-sum game as a social axiom: gains and losses must always offset each other, even if not directly related by a specific transaction (Rozycka-Tran et al., 2015). On the other hand, people can believe in the transactional nature of happiness. According to this zero-sum view, the beneficiary of an interaction "gains" happiness at the expense of another; not unlike zero-sum beliefs of specific transactions or negotiations (Thompson & Hastie, 1990). In BZSH, as we understand it, both sub-beliefs are at play.

We propose a novel, integrative set of predictions. Specifically, we hypothesize that (1) BZSH discourages prosocial behavior as individuals high in BZSH might imagine helping others will cost them, and that (2) this reluctance ironically short-circuits people's ability to benefit from helping others, ultimately limiting their prospects of happiness. To test this, we conducted the following studies.

Studies 1a-1c

We first developed, validated, and established a measure of BZSH. We then explored the

correlation of this new measure with prosocial attitudes and behavior, as well as subjective

happiness. As described above, previous work has examined zero-sum beliefs in the economic

domain, often known as belief in a zero-sum game (BZSG). To test whether BZSH predicts

behavior and experience above and beyond general zero-sum thinking, we included both BZSH

and BZSG in all key analyses, and examined the variance captured by BZSH when controlling

for BZSG.

We hypothesize that (H1) adjusting for BZSG, BZSH will negatively predict prosociality;

and that (H2) a negative relationship between BZSH and happiness will be mediated by

prosociality, adjusting for BZSG. Further, we hypothesize that (H3) BZSG will not show the

same effects when inserted into the same models.

Method

Reproducibility

De-identified datasets, analysis scripts, preregistrations, materials, and measures can be found in

this Open Science Framework repository:

https://osf.io/phyek/?view_only=a5f21e006fd040a59b13c466a3e6db7b

Participants

Participants were recruited through Amazon Mechanical Turk. After excluding participants who

failed attention checks, the final sample consisted of 194 participants in Study 1a (108 women;

144 White; median income $50,000-$74,999), 490 participants in Study 1b (270 women; 365

White; median income $50,000-$74,999), and 492 participants in Study 1c (297 women; 350

White; median income $35,000-$49,999). Sample sizes of Studies 1b and 1c were determined based on power analyses to detect effect sizes observed in Study 1a (Cohen's $d = .04$), as preregistered. For a full breakdown of demographic information, see Table S1 in the supplemental material).

Measures

Study 1a was exploratory in nature and therefore included a wide variety of variables. After its completion, we preregistered hypotheses and analyses of only a portion of those variables, later measured in Studies 1b and 1c. Here we describe measures that were included in the preregistrations and analyzed in all three studies.

Belief in zero-sum happiness. We adapted the BZSH scale from the general BZSG scale described below. Instead of an economic game zero-sum perspective, the BZSH scale measures a specific belief about happiness as a limited resource and its nature in social interactions.

In Study 1a, we tested an 8-item scale, adapting items from the BZSG scale to reflect happiness instead of economic outcomes (Rozycka-Tran et al., 2015). One item was identical to an item from the BZSG scale ("in most situations, interests of different people are inconsistent"), so it was excluded from Study 1b. The distributions of BZSH scores in Studies 1a and 1b were right-skewed (see Figures S1a and S1b in the supplemental material), so we adjusted two items to be more easily agreed with and still maintain face validity of the BZSH construct. As introduced in the previous section, this construct captures two complementary beliefs: (1) happiness as a limited resource and (2) helping as a vessel for happiness transactions. In Study 1c, we finalized the scale (see Table 1, Cronbach's $\alpha = .77$) and reached a distribution that was less skewed (see Figure S1c in the supplemental material).

Table 1

BZSH scale items and their alpha loadings in Study 1c

Item text	α loading
Happiness is a limited resource – there's only so much to go around	.72
In a group of people, if someone becomes happier, it's usually at the expense of someone else in the group	.72
People are happier when those who make them happy work hard and suffer in order to do so	.74
When someone helps another person, they use up their own energy	.78
When people help others, they also end up better off themselves (R)	.75
Behavior that makes others happier leads to greater happiness for the person who performs that behavior (R)	.76
Expending effort that is intended to help others comes at a cost of one's own well-being	.74

Note. R = reverse-scored item

Belief in zero-sum game. This scale measures a general worldview in which one person's gain comes at a necessary cost to someone else (BZSG; Rozycka-Tran et al., 2015). The scale includes items such as "[I]f someone gets richer, it usually means somebody else gets poorer." Participants indicated the extent to which they agreed with each item (1 = *Strongly Disagree* to 7 = *Strongly Agree*). Across studies, internal consistency was reliable at Cronbach's α = .85.

Prosocial behavior and attitudes. We measured prosociality with a combination of items from the Intentions of Prosocial Behavior Scale (Baumsteiger & Siegel, 2018), the Communal Orientation Scale (Clark, Ouellette, Powell, & Milberg, 1987), the Positive Empathy Scale (Morelli, Lieberman, & Zaki, 2015), and the Interpersonal Reactivity Index (Davis, 1980). This scale emerged from an exploratory factor analysis in Study 1a and a confirmatory factor analysis in Study 1b. Participants indicated the extent to which they were likely to engage in a set of behaviors (1 = *Not at All Likely* to 7 = *Extremely Likely*), such as "assist a stranger with a small task." They also indicated the extent to which they agreed (1 = *Strongly Disagree* to 7 =

Strongly Agree) with several statements, such as "[I] often go out of my way to help another person" and one reverse-scored item that reads "[W]hen I see someone being treated unfairly, I sometimes don't feel very much pity for them." Overall, the final scale consists of 8 items, with an internal reliability of Cronbach's α = .84 across the three studies.

Subjective happiness. To measure subjective happiness, we administered the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999). This 4-item scale includes statements, such as "[I]n general, I consider myself…" (1 = *Not a Very Happy Person* to 7 = *A Very Happy Person*), and a reverse-scored item in which participants were asked to indicate the extent to which the following statement characterizes them (1 = *Not at All* to 7 = *Very Much*): "Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?" Across the three studies, internal reliability was sufficient at Cronbach's α = .90.

Analysis plan

We began by assessing the consistency of the new BZSH scale, computing Cronbach's α, and examining potential latent variables through exploratory factor analyses. We assessed the scale's discriminant validity against the BZSG scale to predict our outcomes of interest. That is, we inserted both into our models and examined the unique variance explained by BZSH, over and above the variance explained by BZSG. We tested external validity with the exploration of the second part of the analysis, described below.

To assess the predictive power of BZSH, we ran a mediation model in which the relationship between BZSH and subjective happiness is mediated by prosocial attitudes and behaviors. First conducted as an exploratory analysis in Study 1a, we then preregistered a confirmatory analysis in Studies 1b and 1c. In addition, we hypothesized and preregistered that

BZSG, when included in the model as a predictor alongside BZSH, will not show the same patterns. To rule out potential suppressor effects of BZSG and BZSH on one another, we also inserted each into separate models as lone predictors.

Results

Factor analysis of the final BZSH scale shows a single factor emerging without latent variables. We conducted a minimum-residual factor analysis and the eigenvalue of a single factor model that came out was much higher (2.42) than the eigenvalue of 2-factor model (.45). For a scree plot, see Figure S2 in the supplemental material.

To test the relationship between BZSH, self-reported prosociality, and subjective happiness, we conducted a linear regression and a mediation model. First, we conducted an exploratory factor analysis with all items included and observed that BZSH and BZSG emerge as a separate factor (see Table S2 in the supplemental material for factor loadings). Then, to arrive at valid measures of prosociality and subjective happiness, we conducted a factor analysis of all items in Study 1a excluding BZSH and BZSG (see Table S3 in the supplemental material for a full breakdown of the factor analysis). After conducting exploratory analyses in Study 1a, we preregistered the observed patterns and conducted confirmatory analyses in Study 1b and in Study 1c with the updated BZSH scale (see Figure 1).

In these analyses, we specified BZSH and BZSG as predictors, prosociality as the mediator, and subjective happiness as the outcome. This allowed us to observe discriminant effects of BZSH and BZSG on the mediator and outcome. In Study 1a, accounting for BZSG, BZSH negatively predicted prosociality ($b = -.35$, $SE = .09$, $t(191) = -4.00$, $p < .001$), which in turn, was marginally predictive of subjective happiness ($b = .23$, $SE = .12$, $t(191) = 1.94$, $p =$

.054). BZSG, on the other hand, did not predict prosociality (b = -.07, SE = .06, t(191) = -1.05, p = .296).

After preregistering hypotheses based on these exploratory findings, we conducted Study 1b on a larger sample (N = 490). In Study 1b, again accounting for BZSG, BZSH negatively predicted prosociality (b = -.54, SE = .04, t(487) = -11.96, p < .001), which in turn, positively predicted subjective happiness (b = .41, SE = .07, t(486) = 5.68, p < .001). The indirect effect of BZSH on subjective happiness was strong as well (b = -.20, SE = .07, t(487) = -2.96, p = .007), while the direct effect was not significant (b = .02, SE = .06, t(486) = .27, p = .787), indicating that prosociality fully explains the relationship between BZSH and subjective happiness, when accounting for BZSG.

In Study 1c, we replicated this finding with an updated measure of BZSH. Accounting for BZSG, BZSH negatively predicted prosociality (b = -.45, SE = .04, t(489) = -10.54, p < .001), which in turn positively predicted subjective happiness (b = .34, SE = .07, t(488) = 4.96, p < .001). Again, the relationship between BZSH and subjective happiness was fully mediated by prosociality, with the indirect link emerging as significant (b = -.23, SE = .07, t(489) = -3.52, p < .001), and the direct link emerging as non-significant (b = -.08, SE = .07, t(191) = -1.12, p = .263). Because three of the items in the updated BZSH scale are explicitly related to helping behavior, we show that these patterns hold with an abbreviated scale that excludes those items (α = .73; see Table S3 in the supplemental material). In all studies, the relationship between BZSG and prosociality was either much weaker than that of BZSH and prosociality or non-significant (for detailed results, see Table 2). When BZSG and BZSH were inserted into separate mediation models as sole predictors, BZSG showed either much weaker (vs. BZSH) or non-significant

relationships with prosociality (see Table S4 in the supplemental material). For simple

correlations between variables in Study 1c, see Table S5 in the supplemental material.
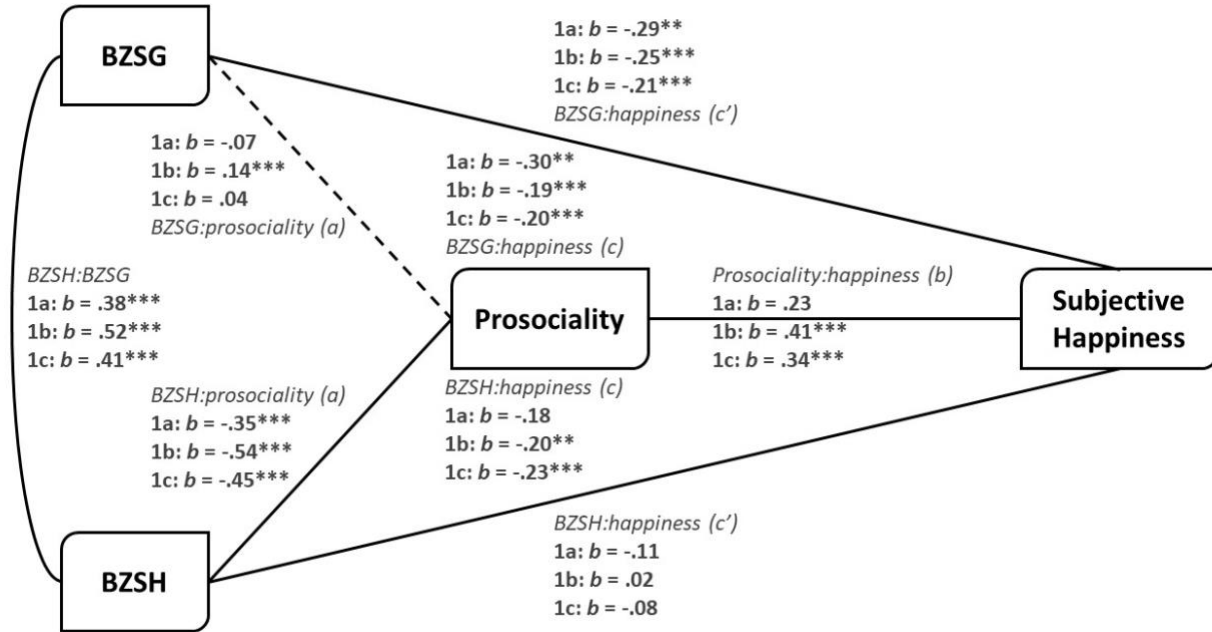

Figure 1. Summary of mediation models in Studies 1a-1c. BZSH = Belief in Zero-Sum
Happiness; BZSG = Belief in Zero-Sum Game; *a* = relationship between predictor and mediator;
b = relationship between prosociality and subjective happiness; *c* = indirect link; *c'* = direct link;
*p < .05; **p < .01; ***p < .001

Table 2
Detailed results of mediation analyses conducted in Studies 1a-1c

		BZSG			BZSH			b
		a	c	c'	a	c	c'	
	b	-.07	-.30	-.29	-.35	-.18	-.11	.23
Study 1a	*SE*	.06	.10	.10	.09	.14	.15	.12
	p	.296	.003	.005	< .001	.196	.475	.054
	b	.14	-.19	-.25	-.54	-.20	.02	.41
Study 1b	*SE*	.03	.06	.06	.04	.07	.08	.07
	p	< .001	< .001	< .001	< .001	.007	.787	< .001
	b	.04	-.20	-.21	-.45	-.23	-.08	.34
Study 1c	*SE*	.04	.06	.06	.04	.07	.07	.07
	p	.263	< .001	< .001	< .001	< .001	.263	< .001

Discussion

In Studies 1a-1c, we developed and validated a measure of belief in zero-sum happiness (BZSH). Because these studies were conducted with separate samples, we were not able to check for test-retest reliability to validate BZSH's stability as an individual difference over time. Items in the scale, though, are worded as general beliefs about the world and thus are unlikely to meaningfully change within individuals between measurements. The measure of BZSH is right-skewed, indicating that overall people tend to believe happiness is more win-win than zero-sum. That said, as reported above, the variance in its distribution still tracks important constructs such as prosociality and subjective happiness. We find that above and beyond general zero-sum beliefs (i.e., BZSG; Rozycka-Tran et al., 2015), BZSH negatively predicts prosociality (H1). The negative relationship between BZSH and subjective happiness is fully explained by a decreased likelihood to report prosocial behavior (H2). BZSG, on the other hand, while negatively related to subjective happiness as well, is either weakly or non-significantly related to prosociality (H3). In other words, BZSH might deplete happiness by deterring from a happiness-inducing behavior: helping others.

Studies 2a-2c

Believers in zero-sum happiness are less likely to help others, but does BZSH play a direct role in reducing prosociality? To test this, we designed an experimental manipulation of BZSH and

examined whether believing that happiness is zero-sum (vs. win-win) leads people to donate less (H4), and if that, in turn, affects ensuing happiness (H5).

In Study 2a, we tested the efficacy of a BZSH manipulation and explored its effects on prosocial spending and ensuing happiness. After establishing that manipulation and noting exploratory findings in Study 2a, we preregistered Studies 2b and 2c and conducted confirmatory analyses with larger sample sizes.

Method

Participants

We recruited a total of 2,200 American participants through Prolific Academic across studies (conducted in separate timepoints). They completed our 12-minute study in exchange for a base payment of $2. After excluding participants who failed post-manipulation attention checks, our final samples consisted of 2,018 participants. Of those, 439 completed Study 2a (212 women; 330 White; median income $50,000-$59,999); 667 completed Study 2b (366 women; 496 White; median income $50,000-$59,999); and 912 completed Study 2c (451 women; 709 White; median income $50,000-$59,999). The sample size of Study 2b was determined based on a power analysis to detect a medium effect size, as observed in Study 2a (Cohen's $d = 0.20$). The sample size of Study 2c was determined based on a power analysis to detect a small-medium effect size, as observed in Study 2b (Cohen's $d = 0.14$). See Table S1 in the supplemental material for full demographic information.

Procedure

After providing informed consent, participants were randomly assigned to one of two conditions: win-win (i.e., low BZSH) or zero-sum (i.e., high BZSH). Those in the win-win condition read

about the benefits of prosocial behavior, and those in the zero-sum condition read about the personal costs of prosocial behavior (see materials for detailed description). After verifying that participants read the passage, we administered our BZSH scale as a manipulation check. Participants then received an unexpected one-dollar bonus in addition to their two-dollar base pay and were given the opportunity to allocate that dollar between five options: four charity options and one option to keep the bonus for themselves. After that, participants completed a measure of state-happiness, as well as a brief demographic questionnaire.

Materials

Participants were asked to read a short fictitious article on the personal benefits/costs of prosocial behavior. In that article, a character shares his experience of volunteering his time in disaster-relief across the country. In the win-win condition, he emphasizes the emotional benefits of helping those in need, in spite of the potential costs. In the zero-sum condition, he emphasizes the personal costs that come with helping those in need. His experience is supported by findings from a psychology lab at Harvard. The passage ends with a call to either take notice of the emotional burden of prosocial behavior or note its personal benefits, in accordance with condition. For the full manipulation, see Appendix S1 in the supplemental material.

Measures

      Belief in zero-sum happiness. We administered the previously validated BZSH scale as a manipulation check (see scale development section in Studies 1a-1c). Cronbach's α across Studies 2a-2c = .80.

      Prosocial spending. Participants received a one-dollar bonus after reading the article. We then presented them with the option to allocate that bonus to any of four charities, as well as one personal gain option. In Study 2b, there was one extra step prior to that: dividing the dollar

to *charity* and *keep to oneself*. With the money they allocated to charity, participants in Study 2b could then divide that amount between the four charities. Importantly, although the passage was fictitious, the donations were real. In all three studies, the charities remained consistent: Coalition for the Homeless (see coalitionforthehomeless.org), Center for Disease Philanthropy (COVID-19 fund; see disasterphilanthropy.org/cdp-fund/cdp-covid-19-response-fund), Leukemia and Lymphoma Society (see lls.org), and Elizabeth Glaser Pediatric AIDS Foundation (see pedaids.org/focus/our-programs). We provided participants with a description of each charity as well as links to their websites. The total amount allocated must have totaled 100 cents in order to proceed to the next step. The sum of the amount given to the four charities was computed as a measure of prosocial spending. For a visualization and full description of this measure, see Appendix S2 in the supplemental material.

Positive affect. Positive affect was measured with the Positive And Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) with one additional positive emotion: *happy*. In the PANAS, participants were asked to indicate the extent to which they were feeling 10 negative emotions (e.g., *sad*) and 11 positive emotions (e.g., *happy*; $1 = $ *Not at All* to $5 = $ *Very Much*) at the moment of answering the survey. Ratings of the 11 positive emotions were then averaged to a single score of positive affect (Cronbach's α across Studies 2a-2c = .93).

Results

As manipulation checks, we conducted two-sample t-tests examining the effect of condition on BZSH. In all three studies, participants in the zero-sum condition (2a: $M = 3.76$, $SD = .87$; 2b: $M = 3.67$, $SD = .81$; 2c: $M = 3.74$, $SD = .88$) scored significantly higher on the post-manipulation measure of BZSH than participants in the win-win condition (2a: $M = 2.80$, $SD = .96$; 2b: $M = $

2.72, SD = .92; 2c: M = 2.60, SD = .82), 2a: $t(401)$ = 10.82, SE = .09, 95% CI = [.78, 1.13], $p <$

.001, d = 1.05; 2b: $t(645)$ = 14.01, SE = .07, 95% CI = [.81, 1.08], $p <$ .001, d = 1.09; 2c: $t(909)$

= 20.30, SE = .06, 95% CI = [1.03, 1.25], $p <$ .001, d = 1.34.

To test the effect of condition on the main dependent variable, prosocial spending, we

conducted two-sample t-tests. In Study 2a, participants in the win-win condition (M = 61.93, SD

= 42.93) donated more of their bonus than participants in the zero-sum condition (M = 53.17, SD

= 43.70), $t(422)$ = 2.11, SE = 4.15, 95% CI = [.59, 16.92], p = .036, d = .20 (see Figure 2a). In

Study 2b, however, when prosocial spending was measured in a slightly different way, we see

only a marginal effect of condition on prosocial spending ($M_{\text{win-win}}$ = 55.27, $SD_{\text{win-win}}$ = 39.49,

$M_{\text{zero-sum}}$ = 49.89, $SD_{\text{zero-sum}}$ = 39.89, $t(664)$ = 1.75, SE = 3.07, 95% CI = [-.65, 11.42], p = .080, d

= .14; see Figure 2b). Then, in a preregistered, higher-powered replication of Study 2a, a stronger

effect of condition on prosocial spending emerged. In Study 2c, participants in the win-win

condition (M = 60.62, SD = 43.46) donated 23.24% more (~11 cents), on average, than

participants in the zero-sum condition (M = 49.19, SD = 43.34), $t(903)$ = 3.98, SE = 2.87, 95%

CI = [5.79, 17.07], $p <$ .001, d = .26 (see Figure 2c). The total donation variable was not

normally distributed, so we also implemented Mann-Whitney corrections to the p-values, and the

patterns still hold (Study 2a: p = .042; Study 2b: p = .091; Study 2c: $p <$ .001). Additionally, we

created a binarized donation variable (i.e., whether participants donated at all or not). A logistic

regression revealed that participants in the win-win condition were more likely to donate than

participants in the zero-sum condition, b = .42, SE = .14, z = 2.90, p = .004. A mini meta-analysis

across Studies 2a-2c revealed a reliable and significant relationship between condition and total

donation, with a standardized mean difference of .21 (z = 4.64, 95% CI = [.12, .30], $p <$ .001).
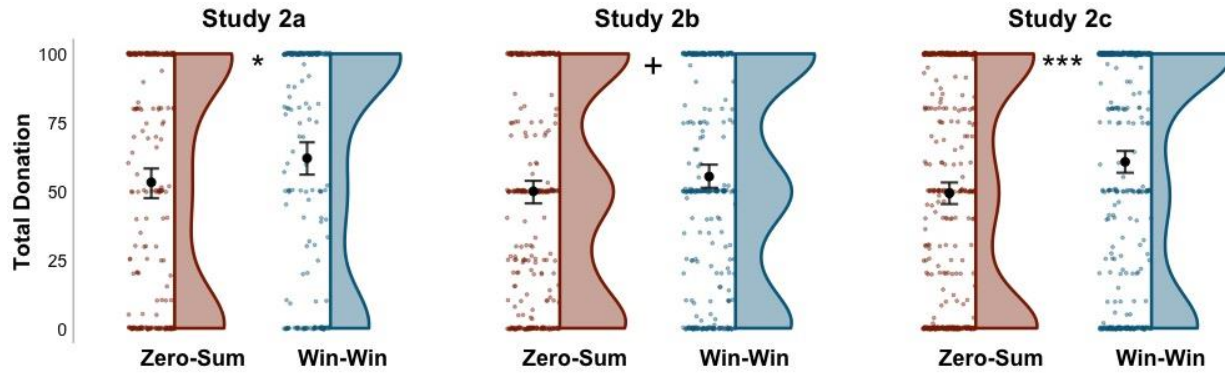
Figure 2. Effect of condition on total cents donated of participants' $1-bonus. Error bars represent 95% confidence intervals. +*p* < .10, *p < .05, ***p < .001.

We next examined the indirect effect of condition on positive affect, through amount donated. That is, are people who are led to believe that happiness is zero-sum (vs. win-win) consequently less happy? And is that decreased happiness explained by the amount they chose to donate?

To test that, we first compared post-donation happiness between participants in the win-win condition and participants in the zero-sum condition. In Study 2a, participants in the win-win condition (*M* = 3.02, *SD* = .96) reported greater positive affect than participants in the zero-sum condition (*M* = 2.81, *SD* = .92), *t*(410) = 2.35, *SE* = .09, 95% *CI* = [.03, .39], *p* = .019, *d* = .23. In Study 2b, though, there was no effect of condition on positive affect ($M_{win-win}$ = 2.85, $SD_{win-win}$ = .93, $M_{zero-sum}$ = 2.80, $SD_{zero-sum}$ = .95, *t*(664) = .72, *SE* = .07, 95% *CI* = [-.19, .09], *p* = .470, *d* = .06). In Study 2c, participants in the win-win condition (M = 2.87, SD = .82) reported greater positive affect than participants in the zero-sum condition (M = 2.76 = SD = .86), *t*(908) = 2.01, *SE* = .06, 95% *CI* = [.00, .22], *p* = .045, *d* = .13. A mini meta-analysis showed that, overall, participants in the win-win condition reported greater positive affect than participants in the zero-sum condition, with a standardized mean difference of .13, *z* = 2.85, 95% *CI* = [.04, .21], *p* = .004.

Were participants in the win-win condition happier because they believed that happiness is win-win or because they donated more after learning this? We did not manipulate prosocial spending and therefore cannot answer that question directly, but we assessed this indirectly through a mediation model, using condition (win-win or zero-sum) as the predictor, amount donated as the mediator, and positive affect as the outcome.

In Study 2a, condition (1 = win-win; 0 = zero-sum) positively predicted the amount donated ($\beta = .20$, $p = .036$), which positively predicted positive affect ($\beta = .12$, $p = .014$). In Study 2b, condition did not affect the amount donated ($\beta = .14$, $p = .080$), nor did it have a direct effect on positive affect ($\beta = .04$, $p = .590$), but the amount donated did positively predict ensuing positive affect ($\beta = .11$, $p = .007$). This indicates that positive affect is related more closely to charitable giving than to a belief that happiness is win-win (vs. zero-sum). In Study 2c, a similar pattern to that of Study 2a emerged. Condition positively predicted the amount donated ($\beta = .26$, $p < .001$), which positively predicted positive affect ($\beta = .09$, $p = .005$). For a full report of the mediation analyses results, see Figure 3 and Table 3.
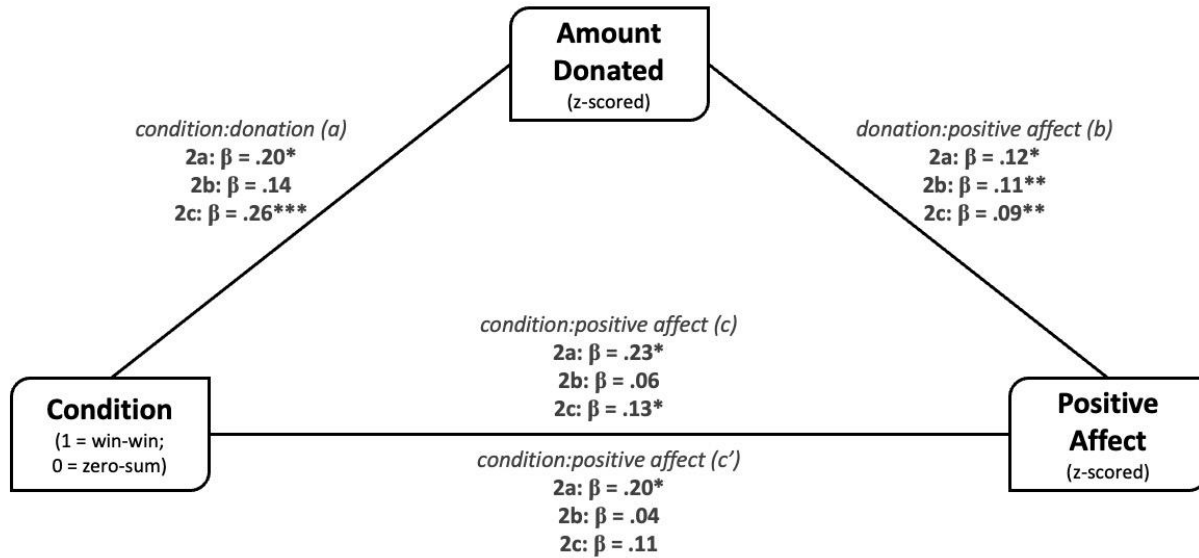
Amount Donated (z-scored)

condition:donation (a)
2a: β = .20*
2b: β = .14
2c: β = .26***

donation:positive affect (b)
2a: β = .12*
2b: β = .11**
2c: β = .09**

condition:positive affect (c)
2a: β = .23*
2b: β = .06
2c: β = .13*

Condition (1 = win-win; 0 = zero-sum)

Positive Affect (z-scored)

condition:positive affect (c')
2a: β = .20*
2b: β = .04
2c: β = .11

Figure 3. Mediation models conducted in Studies 2a-2c. a = relationship between condition and amount donated; b = relationship between amount donated and positive affect; c = indirect link; c' = direct link; *p* < .05; **p* < .01; ***p* < .001

Table 3

Detailed results of mediation analyses conducted in Studies 2a-2c

		a	b	c	c'
Study 2a	β	.20	.12	.23	.20
	SE	.10	.05	.10	.10
	p	.035	.014	.019	.036
Study 2b	B	.14	.11	.06	.04
	SE	.08	.04	.08	.08
	p	.080	.007	.471	.590
Study 2c	β	.26	.09	.13	.11
	SE	.07	.03	.07	.07
	p	< .001	.005	.045	.104

Notes. The predictor (condition) is coded as 1 = *win-win* and 0 = *zero-sum*; a = relationship between condition and amount donated; b = relationship between amount donated and positive affect; c = indirect effect; c' = direct effect; coefficients are standardized.

Discussion

The results of Studies 2a-2c indicate a causal relationship between belief in zero-sum happiness and prosocial spending. Overall, participants who were led to believe that happiness is win-win tended to donate a larger portion of their bonus (H4) than those who read that happiness was zero-sum. We observed this effect in individual analyses for each study (with the exception of a marginal effect in Study 2b), as well as a preregistered mini meta-analysis across studies.

The results of Study 2b were not conclusive ($p = .080$), but we believe that this is due to measurement error. Unlike Studies 2a and 2c, participants in Study 2b were explicitly asked how much of their bonus they would like to give to charity and how much of it they would like to keep to themselves. Only then were they shown the proposed charities, their descriptions, and links to their websites. In Studies 2a and 2c, participants were directly shown all five options: four charities and one option to keep the money to themselves. Structure in presentation of donation bids matters (for a review, see Oppenheimer & Olivola, 2011). For instance, people donate more when presented with multiple options than when presented with an all-encompassing single option (Weisz & Cikara, under review). Indeed, participants donated less in Study 2b ($M = 52.52$, $SD = 39.75$) than in Study 2a ($M = 57.10$, $SD = 43.53$) and Study 2c ($M = 54.65$, $SD = 43.70$). This suggests that our presentation of donation options in Study 2b might have suppressed overall donation, and also suppressed our ability to detect effects related to BZSH.

We also show here the downstream consequences on positive affect. Prosocial spending was not manipulated, and we can therefore not infer its causal impact on affect, but we can take advantage of their sequential measurement to determine potential causal pathways. Positive affect was measured after the manipulation and after the opportunity to donate, but it was

explained more by donation than by condition (H5), suggesting that people are happier because they donated more, and not directly because of their belief that happiness is win-win. This conclusion gains even more ground when examining the mediation model conducted in Study 2b. There, condition did not directly affect prosocial spending or positive affect, but prosocial spending did positively predict pursuant positive affect. Although prosocial spending was not manipulated in Studies 2a-2c, the order in which charitable donations and positive affect were measured lends credence to the directionality of this effect.

General Discussion

Helping others is often a powerful route to increasing helpers' happiness; here, we show that people's belief about this relationship matters as well. When individuals believe that happiness is zero-sum, they might avoid helping others, in turn ironically depriving *themselves* of a key driver of happiness.

In a set of observational studies, we show that (H1) those who believe that happiness is zero-sum are less likely to report prosocial behavior; that (H2) they also report less subjective happiness, and that this relationship is fully explained by their decreased likelihood to help others; and that (H3) these relationships hold over and above general zero-sum beliefs. Experimentally, we found that (H4) BZSH leads to lesser prosocial spending; and that (H5) ensuing dampened positive affect is fully explained by lower donations, adjusting for BZSH.

Because we did not have a "true" control condition, we cannot directly know if believing that happiness is win-win makes people donate more, or if believing that happiness is zero-sum makes people donate less, compared to baseline. That said, we can rely on previous findings showing that people tend to donate roughly half of their bonus (Deck & Murphy, 2019;

Drouvelis & Marx, 2021). With that in mind, win-win condition donations were significantly higher than 50% of the bonus (Study 2a: $t(196) = 3.90$, $p < .001$; Study 2b: $t(325) = 2.41$, $p = .016$; Study 2c: $t(435) = 5.11$, $p < .001$), whereas zero-sum condition donations were not statistically distinguishable from it (Study 2a: $t(241) = 1.13$, $p = .260$; Study 2b: $t(340) = -.05$, $p = .960$; Study 2c: $t(475) = -.41$, $p = .684$). That is, these findings suggest that believing happiness is win-win leads to greater donations.

Our experimental findings are limited to small amounts of prosocial spending, rather than all aspects of prosocial behavior. That said, prosocial spending generalizes to other forms of prosociality, such as self-reported empathic concern and effort exerted to help others (Nook, Ong, Morelli, Mitchell, & Zaki, 2016; Study 3). Our understanding of BZSH and its effects will benefit from future exploration of additional prosocial behaviors with greater amounts.

Importantly, the manipulation applied in Studies 2a-2c is somewhat limited. Although both conditions are similar in tone, one can argue that the win-win condition passage is simply more positive, and that is why we see the effect on donation. This is a limitation, but it does not discredit the role of BZSH in pursuant donations. In fact, we argue here that seeing happiness as win-win *is* more positive, so any manipulation that does not seem more positive will likely miss the construct at hand. Does the zero-sum condition influence beliefs about empathy fatigue? It likely does, but we empathy fatigue is an integral part of the zero-sum nature of happiness beliefs. The way in which people likely believe they are "giving up" happiness is with the effort they exert when showing kindness to others.

Across studies, our sample consisted of paid Mechanical Turk and Prolific workers who are not entirely representative of the American population (Arechar & Rand, 2021; Newman, Bavik, Mount, & Shao, 2020), nor are they representative of the world at large. Future studies on

BZSH will benefit greatly from expanding the population of interest to a broader segment of the American population, as well as different cultures around the world. People under different political and economic systems might make different attributions about happiness and its relation to prosocial behavior, so only with culturally varied samples will we be able to make generalized conclusions about human behavior.

Digging deeper into this belief, we discuss here two potential ways in which BZSH can be conceptualized: seeing happiness as a 'fixed pie' vs. seeing happiness as transactional. People who endorse a fixed pie belief see happiness as a limited resource: individual happiness levels fluctuate but the overall levels are static. On the other hand, people who endorse transactional beliefs view happiness as a material good passed from one party to the other in a transaction: if I 'increase' your happiness, my happiness necessarily 'decreases.' We conceptualized and measured BZSH as a belief in both, but the experimental manipulation focused only on the transactional aspect. An experimental examination of the 'fixed pie' aspect of BZSH may lead to different results. For example, seeing happiness as a limited resource may relate more to individuals' tendency to return back to baseline after positive or negative events (Brickman & Campbell, 1971; for discussion see Lucas, 2007). Further experimental exploration of this facet of BZSH is needed to understand its scope.

In addition to *broadening* the exploration of BZSH to its 'fixed pie' aspects, we can also *deepen* the exploration of its transactional conceptualization. Potentially, believers in zero-sum happiness are extrapolating from material transactions to "emotional transactions." When it comes to monetary resources, in countries that undergo economic downturn, people are more likely to see success as zero-sum (Sirola & Pitesa, 2017; Study 1), and zero-sum construals lead employers to help their employees less (Sirola & Pitesa, 2017; Studies 2-3). In that same vein, if

you are lacking the "resource of happiness" for whatever reason, engaging in an effortful

prosocial behavior for someone else's benefit might seem like a bad idea. In reality, though, that

intuition is likely false: helping behavior predicts greater pursuant positive mood, and that is

even more beneficial for those with depressive symptoms (Schacter & Margolin, 2019).

This work also has practical implications. Further exploration of such implications can

include interventions that aim to alter people's beliefs about the nature of happiness and its

relation to prosocial behavior. For example, in the classroom, teachers can teach about the well-

being benefits of helping fellow classmates with assignments. If effective, such interventions can

be implemented in large-scale online classes and talk series. In time, correcting happiness-related

fallacies such as this can influence social relations at large. This will facilitate norms in which

people are not only informed about the benefits of prosocial behavior, but also get to enjoy them.

Note

In a separate study, we also tried to replicate a prosocial spending recall study (Aknin, Dunn,

Sandstrom, & Norton, 2013) and test its relationship to BZSH. However, we were not able to

replicate the main effect of recall on ensuing happiness, so an examination of BZSH was not

possible. For a full description of method and results of that study, see Appendix S3 in the

supplemental material.

References

Aknin, L. B., Dunn, E. W., Proulx, J., Lok, I., & Norton, M. I. (2020). Does spending money on others promote happiness?: A registered replication report. *Journal of Personality and Social Psychology, 119*(2), e15-e26. https://doi.org/10.1037/pspa0000191

Aknin, L. B., Dunn, E. W., Sandstrom, G. M., & Norton, M. I. (2013). Does social connection turn good deeds into good feelings? On the value of putting the 'social' in prosocial spending. *International Journal of Happiness and Development*, *1*(2), 155-171. https://doi.org/10.1504/IJHD.2013.055643

Aknin, L. B., Van Boven, L., & Johnson-Graham, L. (2015). Abstract construals make the emotional rewards of prosocial behavior more salient. *The Journal of Positive Psychology*, *10*(5), 458-462. https://doi.org/10.1080/17439760.2014.967801

Aknin, L. B., Whillans, A. V., Norton, M. I., & Dunn, E. W. (2019). Happiness and prosocial behavior: An evaluation of the evidence. In J. F. Helliwell, R. Layard, & J. D. Sachs (Eds.), *World Happiness Report* (Ch. 4; pp. 67-86). New York, NY: Sustainable Development Solutions Network

Arechar, A. A., & Rand, D. G. (2021). Turking in the time of COVID. *Behavior Research Methods*, 1-5. https://doi.org/10.3758/s13428-021-01588-4

Baumsteiger, R., & Siegel, J. T. (2018). Measuring prosociality: The development of a prosocial behavioral intentions scale. *Journal of Personality Assessment*, *101*(3), 305-314. https://doi.org/10.1080/00223891.2017.1411918

Bazerman, M. H. (1983). Negotiator judgment: A critical look at the rationality assumption. *American Behavioral Scientist*, *27*(2), 211-228. https://doi.org/10.1177/000276483027002007

Brickman, P., & Campbell, D. T. (1971). Hedonic relativism and planning the good society. In

    M. H. Appley (Ed.), *Adaptation-level theory* (pp. 287-305). New York, NY: Academic

    Press.

Bojanowska, A., & Zalewska, A. M. (2016). Lay understanding of happiness and the experience

    of well-being: Are some conceptions of happiness more beneficial than others? *Journal*

    of Happiness Studies, *17*(2), 793-815. https://doi.org/10.1007/s10902-015-9620-1

Brown, N. D., & Jacoby-Senghor, D. S. (2022). Majority members misperceive even "win-win"

    diversity policies as unbeneficial to them. *Journal of Personality and Social Psychology*,

    122(6), 1057-1097. https://doi.org/10.1037/pspi0000372

Clark, M. S., Oullette, R., Powell, M. C., & Milberg, S. (1987). Recipient's mood, relationship

    type, and helping. *Journal of Personality and Social Psychology, 53*(1), 94-

    103. https://doi.org/10.1037/0022-3514.53.1.94

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS*

    Catalog of Selected Documents in Psychology, *10*, 85.

Deck, C., & Murphy, J. J. (2019). Donors change both their level and pattern of giving in

    response to contests among charities. *European Economic Review*, *112*, 91-106.

    https://doi.org/10.1016/j.euroecorev.2018.12.004

Diener, E., & Oishi, S. (2005). The nonobvious social psychology of happiness. Psychological

    Inquiry, 16(4), 162-167. https://doi.org/10.1207/s15327965pli1604_04

de Dreu, C. K., Koole, S. L., & Steinel, W. (2000). Unfixing the fixed pie: a motivated

    information-processing approach to integrative negotiation. *Journal of Personality and*

    Social Psychology, *79*(6), 975-987. https://doi.org/10.1037/0022-3514.79.6.975

Drouvelis, M., & Marx, B. M. (2021). Dimensions of donation preferences: the structure of peer

and income effects. *Experimental Economics*, *24*(1), 274-302.

https://doi.org/10.1007/s10683-020-09661-z

Dunn, E. W., Aknin, L. B., & Norton, M. I. (2008). Spending money on others promotes

happiness. *Science*, *319*(5870), 1687-1688. https://doi.org/10.1126/science.115095

Erreygers, S., Vandebosch, H., Vranjes, I., Baillien, E., & De Witte, H. (2019). Feel good, do

good online? Spillover and crossover effects of happiness on adolescents' online

prosocial behavior. *Journal of Happiness Studies*, *20*(4), 1241-1258.

https://doi.org/10.1007/s10902-018-0003-2

Falk, A., & Graeber, T. (2020). Delayed negative effects of prosocial spending on

happiness. *Proceedings of the National Academy of Sciences*, *117*(12), 6463-6468.

https://doi.org/10.1073/pnas.1914324117

Jenkinson, C. E., Dickens, A. P., Jones, K., Thompson-Coon, J., Taylor, R. S., Rogers, M., ... &

Richards, S. H. (2013). Is volunteering a public health intervention? A systematic review

and meta-analysis of the health and survival of volunteers. *BMC public health*, *13*(1), 1-

10. https://doi.org/10.1186/1471-2458-13-773

Koo, J., & Suh, E. M. (2007). Is happiness a zero-sum game? Belief in fixed amount of

happiness (BIFAH) and subjective well-being. *Korean Journal of Social and Personality

Psychology*, 21, 1-19.

Lucas, R. E. (2007). Adaptation and the set-point model of subjective well-being: Does

happiness change after major life events? *Current Directions in Psychological

Science*, *16*(2), 75-79. https://doi.org/10.1111/j.1467-8721.2007.00479.x

Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary

reliability and construct validation. *Social indicators research*, *46*(2), 137-155.

https://doi.org/10.1023/A:1006824100041

Meegan, D. V. (2010). Zero-sum bias: Perceived competition despite unlimited

resources. *Frontiers in psychology*, *1*, 1-7. https://doi.org/10.3389/fpsyg.2010.00191

Morelli, S. A., Lieberman, M. D., & Zaki, J. (2015). The emerging study of positive

empathy. *Social and Personality Psychology Compass*, *9*(2), 57-68.

https://doi.org/10.1111/spc3.12157

von Neumann, J., & Morgenstern, O. (1944). *Theory of Games and Economic Behavior*.

Princeton, NJ: Princeton University Press.

Newman, A., Bavik, Y. L., Mount, M., & Shao, B. (2020). Data collection via online platforms:

Challenges and recommendations for future research. *Applied Psychology*, 1-23.

https://doi.org/10.1111/apps.12302

Nook, E. C., Ong, D. C., Morelli, S. A., Mitchell, J. P., & Zaki, J. (2016). Prosocial conformity:

Prosocial norms generalize across behavior and empathy. *Personality and Social

Psychology Bulletin*, *42*(8), 1045-1062. https://doi.org/10.1177/0146167216649932

Oppenheimer, D. M., & Olivola, C. Y. (2011). *The science of giving: Experimental approaches

to the study of charity*. Psychology Press.

Różycka-Tran, J., Boski, P., & Wojciszke, B. (2015). Belief in a zero-sum game as a social

axiom: A 37-nation study. *Journal of Cross-Cultural Psychology*, *46*(4), 525-548.

https://doi.org/10.1177/0022022115572226

Schacter, H. L., & Margolin, G. (2019). When it feels good to give: Depressive symptoms, daily

    prosocial behavior, and adolescent mood. *Emotion*, *19*(5), 923-927.

    https://doi.org/10.1037/emo0000494

Shin, J. E., & Kim, J. K. (2018). How a good sleep predicts life satisfaction: The role of zero-

    sum beliefs about happiness. *Frontiers in Psychology*, *9*, 1-4.

    https://doi.org/10.3389/fpsyg.2018.01589

Shin, J. E., Suh, E. M., Eom, K., & Kim, H. S. (2018). What does "happiness" prompt in your

    mind? Culture, word choice, and experienced happiness. *Journal of Happiness*

    Studies, *19*(3), 649-662. https://doi.org/10.1007/s10902-016-9836-8

Sirola, N., & Pitesa, M. (2017). Economic downturns undermine workplace helping by

    promoting a zero-sum construal of success. *Academy of Management Journal*, *60*(4),

    1339-1359. https://doi.org/10.5465/amj.2015.0804

Thompson, L., & Hastie, R. (1990). Social perception in negotiation. *Organizational Behavior*

    and Human Decision Processes, *47*(1), 98-123. https://doi.org/10.1016/0749-

    5978(90)90048-E

Thompson, L., & Hrebec, D. (1996). Lose–lose agreements in interdependent decision

    making. *Psychological Bulletin*, *120*(3), 396-409. https://doi.org/10.1037/0033-

    2909.120.3.396

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures

    of positive and negative affect: the PANAS scales. *Journal of Personality and Social*

    Psychology, *54*(6), 1063-1070. https://doi.org/10.1037/0022-3514.54.6.1063

Weisz, E., & Cikara, M. (under review). Merely increasing action options increases charitable

    donation. Preprint available at https://doi.org/10.21203/rs.3.rs-59021/v1

Wheeler, J. A., Gorey, K. M., & Greenblatt, B. (1998). The beneficial effects of volunteering for

  older volunteers and the people they serve: A meta-analysis. *The International Journal of*

  Aging and Human Development, *47*(1), 69-79. https://doi.org/10.2190/VUMP-XCMF-

  FQYU-V0JH

Whillans, A. V., Seider, S. C., Chen, L., Dwyer, R. J., Novick, S., Gramigna, K. J., ... & Dunn,

  E. W. (2016). Does volunteering improve well-being? *Comprehensive Results in Social*

  Psychology, *1*(1-3), 35-50. https://doi.org/10.1080/23743603.2016.1273647