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Nadav Klein

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## Prosocial behavior increases perceptions of meaning in life

Nadav Klein

Harris School of Public Policy, University of Chicago, Chicago, IL, USA

### ABSTRACT

Finding meaning in life is a fundamental personal need, and motivating prosocial behavior is a fundamental societal need. The present research tests whether the two are connected – whether helping other people can increase helpers' perceptions of meaning in life. Evidence from a nationally representative data-set and two experiments support this hypothesis. Participants who engaged in prosocial behaviors – volunteering and spending money to benefit others – reported experiencing greater meaning in their lives (Studies 1–3). Study 3 also identifies increased self-worth as the mechanism – participants who spent money to benefit other people felt higher personal worth and self-esteem, and this mediated the effect of prosocial behavior on meaningfulness. The present results join other findings in suggesting that the incentives for helping others do not necessarily depend on the prospect of others' reciprocity. Prosocial behavior can be incentivized through the psychological benefits it creates for prosocial actors.

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Prosocial behavior; meaning in life; well-being; helping; self-worth; self-esteem; social connection

Identifying the conditions necessary for human flourishing depends in part on the perspective one chooses to take. One can take the perspective of an average person and ask, 'what is necessary for an individual to flourish?' Alternatively, one can take the perspective of a community or a society composed of many persons and ask, 'what is necessary for a community to flourish?'

Taking an individual's perspective will invariably highlight the necessity of finding meaning in life as a fundamental personal need (Heintzelman & King, 2014a, 2014b). Viewing one's own life as meaningful is associated with greater longevity, better physical health, and reduced depression and anxiety (Debats, Van der Lubbe, & Wezeman, 1993; Krause, 2009; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000). In contrast, taking a communal perspective will invariably highlight the necessity of prosocial behavior as a fundamental communal need. Prosocial behavior is critical for creating the trust and cooperation necessary to sustain impersonal and complex societies and markets (Bowles & Gintis, 2003; Fehr & Schmidt, 1999; Hamilton, 1964; Henrich et al., 2011; Trivers, 1971). The present research investigates whether the personal and communal perspectives are linked. Specifically, I test whether helping other people can increase helpers' perceptions of meaning in life, thereby establishing an empirical connection between personal and societal flourishing.

There are at least two reasons to predict that helping others can increase a sense of meaning in life. First, helping other people can increase helpers' sense of self-worth, which is one of the basic needs that must be satisfied to achieve a sense of meaning in life, according to prevalent theoretical accounts (Baumeister, 1991; Baumeister & Vohs, 2002). Helping other people can increase self-worth because prosocial behavior is universally admired and valued (Buss, 1989; Klein, Grossman, Uskul, Kraus, & Epley, 2015). Helping other people is a way for helpers to gain social acceptance and build a positive reputation, which in turn increase helpers' social status in their communities (Flynn, 2003; Flynn, Reagans, Amanatullah, & Ames, 2006; Grant & Gino, 2010; Lee, 1997). Because social acceptance is a critical determinant of self-worth and self-esteem (Leary, 1999; Leary & Baumeister, 2000), the reputational benefits of prosocial behavior are likely to increase self-worth, which in turn can increase the sense that life is meaningful.

Second, another reliable predictor of meaningfulness is social connection with others (Baumeister & Leary, 1995; Debats, 1999; Lambert et al., 2013; Stavrova & Luhmann, 2016). Accordingly, social exclusion and loneliness can lead to substantial psychological damage, including decreased sense of meaning in life (Cacioppo, Hawkley, Rickett, & Masi, 2005; Cialdini & Patrick, 2008). Helping another person is one of the most basic ways to establish and reinforce social connection. Therefore, helping

may increase meaningfulness by increasing the sense of connection to others. The present research tests whether either or both of these two potential mechanisms – self-worth and social connection – can explain the relationship between helping and meaningfulness.

### The psychological benefits of helping others

Although helping is primarily intended to benefit recipients, existing research finds that helping creates benefits for helpers as well. As mentioned, the most obvious benefit helpers receive is a boost to their reputation in the eyes of others. Observing a person help another increases evaluations of the helper, and in turn motivates recipients and observers to cooperate with helpers in subsequent interactions (Almenberg, Dreber, Apicella, & Rand, 2011; Gray, Ward, & Norton, 2014; Klein & Epley, 2014). This reputational mechanism is thought to underlie a substantial portion of the incentive for prosocial behavior in general (Barclay, 2004; Nowak & Sigmund, 2005; Rockenbach & Milinski, 2006). Because helping others is viewed positively, helpers can expect to be rewarded with social approval and goodwill.

Helping others also creates psychological benefits that do not necessarily depend on others' judgments and reciprocity. Empirical evidence has thus far pointed to psychological benefits that are mostly hedonic in nature, increasing positive emotion and decreasing negative emotion. For example, spending money to benefit other people can increase happiness compared to spending money to benefit oneself (Dunn, Aknin, & Norton, 2008; Weinstein & Ryan, 2010; Zaki & Mitchell, 2011). Volunteering is associated with higher levels of happiness and life satisfaction (Thoits & Hewitt, 2001; Wheeler, Gorey, & Greenblatt, 1998). Helping can also reduce sadness associated with seeing another person in need of help (Cialdini et al., 1987).

However, meaningfulness and happiness are distinct in important ways. For example, people find meaning in painful and stressful events in their lives, despite being unlikely to extract happiness from such events (Baumeister, Vohs, Aaker, & Garbinsky, 2013). Other experiences, such as nostalgic reflection on the past and thinking about one's own mortality, increase people's sense of meaning despite being hedonically negative (Feldman & Snyder, 2005; King, Hicks, & Abdelkhalik, 2009; Landau, Kosloff, & Schmeichel, 2011; Routledge, Sedikides, Wildschut, & Juhl, 2013; Wade-Benzoni & Tost, 2009). Compared to happiness, meaningfulness spans a wider range of emotions than simply positive ones, and is also associated with purely cognitive processes such as mental simulation and counterfactual thinking (Kray et al., 2010; Waytz, Hershfield, & Tamir, 2015). Therefore, simply because prosocial behavior creates hedonic benefits does not necessarily mean that it also creates eudaimonic benefits. Without a direct empirical

test, the relationship between helping and meaningfulness remains unclear. The present research provides three such empirical tests.

### Study 1: nationally representative sample

As an initial test, I used a nationally representative sample of adult Americans to measure the association between a particular form of prosocial behavior (volunteering) and the sense of meaning in life, while controlling for various demographic variables.

### Method

The Baylor Religion Survey, Wave 2 (Baylor University, 2007) contains a nationally representative study of religious values, practices, and behaviors (total  $N = 1648$ ; 52.98% women; age range = 18–96,  $M_{\text{age}} = 47.35$ ,  $SD_{\text{age}} = 16.82$ ). Among other items, this survey contains questions relevant to the current research. Specifically, the survey asks participants to estimate the amount of hours per month they volunteer in three contexts: (1) volunteering for one's place of worship; (2) volunteering for the community, not through one's place of worship; and (3) volunteering for the community, through one's place of worship. Participants answered these questions on a five-point scale (0 = none; 1 = one to two hours; 2 = three to four hours; 3 = five to ten hours; or 4 = eleven or more hours). As the main independent variable for this study, I created a composite volunteering index by summing these three variables (range: 0–12;  $M_{\text{volunteering}} = 1.75$ ,  $SD_{\text{volunteering}} = 2.33$ ).

The main dependent variable was a question asking participants to indicate their level of agreement with the statement 'my life has a real purpose' on a four-point scale (1 = strongly disagree; 2 = disagree; 3 = agree; or 4 = strongly agree). This was the only question in the survey pertaining to meaningfulness, and it is suitable for measuring perceptions of meaning in life because having a sense of purpose is integral to meaningfulness (Heintzelman & King, 2014a, 2014b). This question contained an additional option for 'undecided' participants. I excluded the 95 participants who chose the 'undecided' option, and also excluded 80 additional participants who failed to answer this question or failed to answer one or more of the questions pertaining to volunteering time, resulting in a usable sample of  $N = 1,473$ .

To verify that the potential association between volunteering and meaning in life is not explained by other variables, I controlled for demographic variables including education, income, race, gender, geographic location, and religious denomination (the sample included not only religious participants but also participants who noted their religious tradition to be 'none').

## Results

Table 1 presents the results of four multilevel regressions testing the relationship between volunteering and perceptions of purpose in life ( $M_{\text{life purpose}} = 3.18$ ,  $SD_{\text{life purpose}} = .63$ ). The first model uses participants' combined volunteering index as the dependent measure, and the other three models use each of the three components of the volunteering index as dependent measures. Controlling for demographic variables, greater volunteering was associated with a stronger belief that one's life has a purpose across all forms of volunteering as well as the combined index, unstandardized  $B$ s > .053,  $t$ s > 3.83,  $p$ s < .01.

Incidentally, two of the seven demographic variables also affected perceptions of life purpose. The first was religious denomination, wherein non-religious participants felt a weaker sense of purpose than members of religious denominations. The second was gender, wherein women tended to experience a stronger sense of purpose than men.

Overall, these results provide initial evidence of the positive effect of prosocial behavior on meaning in life. Survey participants who volunteered more often also reported having more purposeful lives.

### Study 2: manipulating prosocial and self-interested behavior

Because correlational evidence does not enable causal inference, Study 2 experimentally manipulated prosocial

behavior and tested its effects on self-reported meaning in life. To increase the generalizability of any effects found, Study 2 used a different form of prosocial behavior (spending money to benefit other people) and a more comprehensive measure of meaning in life.

## Method

Participants were recruited in a lab in a Midwestern university ( $N = 50$ ; 50% women;  $M_{\text{age}} = 22.32$ ,  $SD_{\text{age}} = 4.79$ ). Because two participants failed to complete the follow-up survey, two additional participants were recruited to complete the targeted sample.

After agreeing to participate in the experiment, each participant was given \$5.00 in cash. The experimental manipulation, adapted from Dunn et al. (2008), was then introduced. Participants were randomly assigned to either the prosocial condition or to the self-interested condition. Participants in the prosocial condition were instructed to 'go out and spend these \$5.00 on a gift for someone else or for a donation to a charity of your choice'. In the self-interested condition, participants were instructed to 'go out and spend these \$5.00 either on a gift for yourself or for a bill or an expense you have'. After leaving the lab, participants were emailed a follow-up survey that contained the dependent measures. Participants had until 8:00 pm on the day they participated to spend the money as instructed and until 8:00 pm on the following day to complete the follow-up survey.

**Table 1.** Association between volunteering and a sense of purpose in life in a nationally representative sample ( $N = 1473$ ).

	Model 1		Model 2		Model 3		Model 4	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Volunteering:								
Combined index	.05*	.01						
Through place of worship			.11*	.02				
Outside of place of worship					.06*	.02		
For place of worship							.12*	.02
Demographic variables:								
Gender	.11*	.03	.11*	.03	.11*	.03	.11*	.03
Education	-.001	.01	.006	.01	.002	.01	.003	.01
Age	-.02	.01	-.02	.01	-.02	.01	-.02	.01
Race	-.003	.02	-.01	.02	-.004	.02	-.003	.02
Income	.003	.01	.003	.01	.003	.01	.005	.01
Denomination: Evangelical	.26*	.06	.27*	.06	.31*	.06	.23*	.06
Denomination: Black Protestant	.39*	.10	.40*	.10	.46*	.10	.38*	.10
Denomination: Mainline Protestant	.14*	.06	.16*	.06	.19*	.06	.15*	.06
Denomination: Catholic	.14*	.06	.15*	.06	.18*	.06	.14*	.06
Denomination: Other	.17*	.07	.20*	.07	.23*	.07	.17*	.07
Geographic region: East	-.04	.05	-.05	.05	-.05	.05	-.04	.05
Geographic region: Midwest	-.03	.05	-.02	.05	-.03	.05	-.03	.05
Geographic region: South	-.01	.05	-.01	.05	.01	.05	-.02	.05

Note: Columns labeled 'B' and 'SE' describe unstandardized regression coefficients and standard errors, respectively. The volunteering index is the sum of participants' self-reported volunteering hours per month for the community through their places of worship, for the community but outside of their places of worship, and directly for the benefit of participants' places of worship. The reference category for gender is men. The reference category for geographic region is Western United States. The reference category for religious denomination is 'none'.

\*Represent coefficients significant at  $p < .05$ .

The follow-up survey contained the Meaning of Life Questionnaire (MLQ; Steger, Frazier, Oishi, & Kaler, 2006), a widely used measure of meaning in life that asks participants to state their level of agreement with 10 statements on 7-point scales. These 10 statements are divided into two subscales that measure two different theoretical constructs. The primary dependent variable in this experiment was the first subscale, which measures the *presence* of meaning in life. This subscale contains five statements such as ‘my life has a clear sense of purpose’ and ‘I understand my life’s meaning’. The second subscale measures people’s active *search* for meaning in life, and contains five statements such as ‘I am searching for meaning in my life’ and ‘I am always looking to find my life’s purpose’. This subscale was not the primary measure of this experiment, but was included for completeness as part of the MLQ.

After completing the MLQ, participants were asked on a five-point scale how closely they followed the spending instructions they were given (1 = not at all; 5 = completely). Finally, participants were asked to describe their purchases in a few sentences.

## Results

### Manipulation checks

The manipulation succeeded. Fully 43 out of the 50 participants (86%) indicated at least ‘4’ or ‘5’ in answering the question of how closely they followed the spending instructions ( $M = 4.38$ ,  $SD = .90$ ). Participants’ open responses describing their purchases indicated that some of the typical purchases for themselves were sweets and snacks, paying off bills, and books. Typical purchases for other people were alcoholic beverages, sweets, and other food items. Two independent coders evaluated participants’ purchases on a scale ranging from 1 (mostly benefiting themselves) to 5 (mostly benefiting other people). The coders exhibited a high level of agreement ( $\alpha = .95$ ), and so I averaged their evaluations. The results confirmed that participants’ purchases in the prosocial condition were more likely to benefit others ( $M = 4.76$ ,  $SD = .50$ )

than purchases in the self-interested condition ( $M = 1.24$ ,  $SD = .61$ ),  $t(48) = 22.17$ ,  $p < .001$ ,  $d = 6.40$ .

### Presence of meaning in life

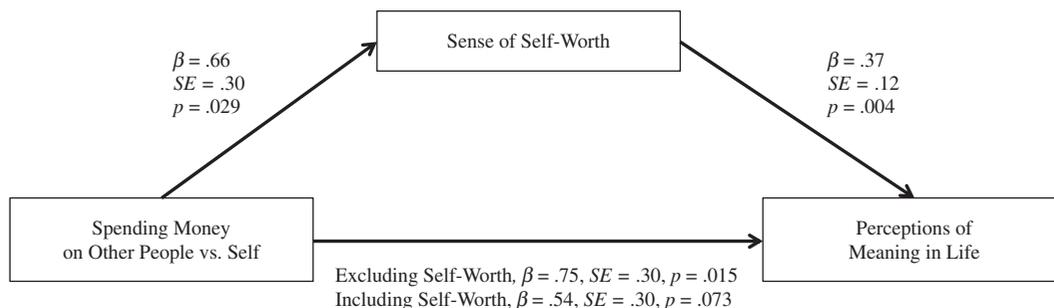
The primary measures in this experiment were the five statements in the MLQ that probe participants’ perceptions of the presence of meaning in their lives. I averaged these five statements to obtain a composite measure of presence of meaning ( $\alpha = .91$ ). Spending money on others increased perceptions of meaning in life ( $M = 5.04$ ,  $SD = 1.24$ ) compared to spending money on the self ( $M = 4.14$ ,  $SD = 1.41$ ),  $t(48) = 2.41$ ,  $p = .020$ ,  $d = .70$ . Spending money to benefit another person increased perceptions of meaning in life.

### Search for meaning in life

I averaged the other five statements from the MLQ that measure participants’ search for meaning in life ( $\alpha = .93$ ). Participants’ search for meaning in life was nearly identical in the prosocial spending condition ( $M = 5.00$ ,  $SD = 1.39$ ) compared to self-interested spending ( $M = 5.02$ ,  $SD = 1.52$ ),  $t(48) = -.04$ ,  $p = .97$ ,  $d = .01$ . Spending money to benefit another person did not affect participants’ search for meaning. This result appears consistent with existing findings suggesting that stronger search for meaning tends to occur when people feel that their lives are currently lacking meaning (Steger, Kashdan, Sullivan, & Lorentz, 2008). If prosocial behavior tends to increase the presence of meaning, then it is unlikely to increase – and may decrease – the major motivation for searching for meaning.

### Study 3: mechanisms underlying increased meaning

Previous studies revealed that prosocial behavior increases perceptions of meaning in life. Study 3 tested possible mechanisms underlying this effect. I tested whether spending money on others increases perceptions of meaning in life through known determinants of meaningfulness:



**Figure 1.** The mediating role of self-worth in the effect of prosocial behavior on perceptions of meaning in life in Study 3.

self-worth, social connection to others, a sense of personal control, and affirmation of moral values (Baumeister, 1991; Baumeister & Vohs, 2002). Like Study 2, participants were instructed either to spend money on themselves or to spend money on other people. Unlike Study 2, here participants also evaluated each of these potential mechanisms in addition to reporting their sense that life is meaningful. Finally, because previous research finds that spending money on others can increase momentary happiness (Dunn et al., 2008), Study 3 also controlled for participants' happiness after they spent money on themselves or on other people.

## Method

Participants were recruited in a lab in a Midwestern university ( $N = 61$ ; 50.8% women;  $M_{\text{age}} = 19.74$ ,  $SD_{\text{age}} = 2.41$ ). As in Study 2, each participant was given \$5.00 in cash and randomly assigned to spend it either on other people (in the form of a gift for someone else or a donation to a charity) or on themselves (in the form of a gift for themselves or another personal expense). After leaving the lab, participants were emailed a follow-up survey that contained the dependent measures and the mediators, and had until 11:00 pm that night to spend the money as instructed and complete the follow-up survey.

The follow-up survey first asked participants to describe in a few sentences how they spent the \$5.00 given to them. Then, participants assessed their sense of self-worth, social connection to others, sense of personal control, affirmation of values, and their happiness. These variables were presented in random order. After completing all of these variables, participants rated the main dependent variable, namely their sense of meaning in life.

Happiness was assessed using the same measures used in previous research (Dunn et al., 2008), specifically a single-item measure ('Do you feel happy, in general?' rated on a 1–5 scale) and the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS contains 10 positive emotions ( $\alpha = .87$ ) and 10 negative emotions ( $\alpha = .85$ ), which were analyzed separately, consistent with previous research.

For all of the other measures, participants rated their level of agreement with a number of relevant statements on identical scales ranging from 1 (absolutely disagree) to 7 (absolutely agree) with the midpoint of 4 (neither agree nor disagree). Below are detailed descriptions of these measures:

### Self-worth

Participants evaluated whether the way they spent the \$5.00 made them feel that they are good and worthy

persons, and whether they felt it increased their self-esteem ( $\alpha = .704$ ).

### Social connection

Participants evaluated whether the way they spent the \$5.00 made them feel closer to other people, whether it helped them increase their sense of belonging to their community, and whether it helped them feel that they were an important part of their community ( $\alpha = .95$ ).

### Sense of personal control

Participants evaluated whether the way they spent the \$5.00 made them feel like they had control of how life unfolded, and whether it gave them a sense of control over the things they wanted to accomplish in life ( $\alpha = .78$ ).

### Affirmation of values

Participants evaluated whether the way they spent the \$5.00 was consistent with their moral values, and whether it seemed morally right ( $\alpha = .94$ ).

### Meaning in Life

For the main dependent variable, participants evaluated whether they spent the \$5.00 in a meaningful way, whether they could easily think of more meaningful ways to spend the \$5.00 they were given (reverse-coded), and whether the way they spent the \$5.00 contributed to their sense of meaning in life in general ( $\alpha = .78$ ).

Finally, as a manipulation check, participants were asked on a five-point scale how closely they followed the spending instructions they were given (1 = not at all; 5 = completely).

## Results

### Manipulation checks

The manipulation succeeded. Fully 57 out of the 61 participants (93%) indicated at least '4' or '5' in answering the question of how closely they followed the spending instructions ( $M = 4.51$ ,  $SD = .65$ ). Two independent coders evaluated participants' purchases on a scale ranging from 1 (mostly benefiting themselves) to 5 (mostly benefiting other people). The coders exhibited a high level of agreement ( $\alpha = .98$ ), and so I averaged their evaluations. The results confirmed that participants' purchases in the prosocial condition were more likely to benefit others ( $M = 4.29$ ,  $SD = 1.11$ ) than purchases in the self-interested condition ( $M = 1.39$ ,  $SD = .96$ ),  $t(59) = 10.99$ ,  $p < .001$ ,  $d = 2.86$ .

**Table 2.** The effects of prosocial behavior on determinants of meaning in Study 3.

Variable	Spending money on other people	Spending money on self
Self-worth	4.53 (1.02) <sub>a</sub>	3.88 (1.26) <sub>b</sub>
Social connection	4.18 (1.32) <sub>a</sub>	3.28 (1.63) <sub>b</sub>
Affirmation of values	5.55 (1.21) <sub>a</sub>	5.28 (1.45) <sub>a</sub>
Personal control	3.67 (1.38) <sub>a</sub>	4.30 (1.27) <sub>a</sub>
Happiness (PANAS positive emotions)	2.97 (.80) <sub>a</sub>	2.78 (.77) <sub>a</sub>
Sadness (PANAS negative emotions)	1.97 (.61) <sub>a</sub>	2.02 (.80) <sub>a</sub>
General happiness (one-item measure)	3.62 (.90) <sub>a</sub>	3.91 (.82) <sub>a</sub>
Meaning in life	3.95 (1.06) <sub>a</sub>	3.21 (1.24) <sub>b</sub>

Note: Standard deviations are in parentheses. Within rows, different subscripts represent means that differ at  $p < .05$ .

### Meaning in life

The effect of prosocial behavior on meaningfulness replicated. Spending money on other people increased perceptions of meaning ( $M = 3.95$ ,  $SD = 1.06$ ) compared to spending money on oneself ( $M = 3.21$ ,  $SD = 1.24$ ),  $t(59) = 2.51$ ,  $p = .015$ ,  $d = .65$ . This result held when entering participants' happiness as a covariate using either the PANAS positive emotions or the single-item measure of general happiness or both,  $F_s > 4.29$ ,  $p_s < .043$ .

### Mediation

To establish mediation, the independent variable must have a statistically reliable effect on the proposed mediator. Therefore, to simplify the subsequent mediation analysis, I first tested whether prosocial behavior had an effect on each of the proposed mediators. If prosocial behavior did not change a mediator, I excluded that mediator from the subsequent mediation analysis.<sup>1</sup>

As Table 2 shows, spending money to benefit other people increased participants' sense of self-worth and social connection compared to spending money on the self,  $t_s > 2.24$ ,  $p_s < .031$ ,  $d_s > .57$ . Spending money on others did not increase participants' affirmation of values,  $t(59) = .79$ ,  $p = .43$ ,  $d = .21$ , and directionally and non-significantly decreased participants' sense of personal control,  $t(59) = -1.84$ ,  $p = .070$ ,  $d = .48$ . Based on these results, I excluded affirmation of values and personal control from the subsequent mediation analysis.<sup>2</sup> Thus, the mediation analysis used spending on others versus the self as the independent variable, perceptions of meaning as the dependent variable, and perceptions of self-worth and social connection as the two proposed mediators (Hayes, 2013; SPSS PROCESS Macro, Model 6; 5,000 iterations).

As Figure 1 shows, the total effect of prosocial behavior on meaning in life was significant,  $\beta = .75$ ,  $SE = .30$ ,  $p = .015$ . The mediation path containing self-worth as the sole mediator was statistically reliable because the 95% confidence interval did not contain the 0 point (indirect effect = .19,  $SE = .15$ ; 95%  $CI$  [.011, .635]). In contrast, the mediation paths containing either social connection as the sole mediator or social connection and self-worth as joint

mediators were not statistically reliable (95%  $CI$ s [−.126, .282] and [−.040, .128], respectively). Furthermore, after including self-worth, the effect of prosocial behavior on meaningfulness was reduced to non-significance,  $\beta = .54$ ,  $SE = .30$ ,  $t = 1.83$ ,  $p = .073$ . These results suggest that prosocial behavior increases perceptions of meaning in life partially through increasing perceptions of self-worth.

### General discussion

A nationally representative sample and two experiments find that prosocial behavior increases perceptions of meaning in life. Helping other people, whether through volunteering or spending money on others, was associated with a greater sense of purpose and meaning. Study 3 suggests that at least part of the effect of helping on meaningfulness lies in increased self-worth – participants who spent money to benefit other people felt higher personal worth and self-esteem, which in turn increased their sense that life is meaningful.

The present results appear to coincide with well-known aphorisms suggesting that to find meaning in life, one must be motivated by something 'greater' than oneself. In philosophy, Ralph Waldo Emerson is quoted as saying that 'the purpose of life is not to be happy', but rather 'it is to be useful' to others (Brown, 2000). In literature, Charles Dickens (1864) echoes a similar sentiment through the main character in the novel *Our Mutual Friend*: 'no one is useless in this world who lightens the burden of it for anyone else'. In religion, the Bible suggests an association between prosociality and meaning in life (e.g. Galatians, 5:13–14) and Buddhism promotes benevolence (*mettā*), sympathy (*muditā*), and compassion (*karuṇā*) as essential qualities necessary for enlightenment. The conventional wisdom that meaning is generated by being useful to other people appears to have solid empirical foundations.

### Implications and extensions

Prosocial behavior is important partly because it creates the cooperation and trust necessary to sustain communities and societies (Fehr & Schmidt, 1999; Hamilton, 1964;

Henrich et al., 2011; Trivers, 1971). These far-reaching positive consequences underlie the widespread interest in the incentives people have for helping one another. Leading accounts of how helping is incentivized generally emphasize the role of recipients' and observers' favorable responses to prosocial actors, suggesting that reputational concerns motivate prosocial behavior (Barclay, 2004; Nowak & Sigmund, 2005; Rockenbach & Milinski, 2006). The present study joins other studies in highlighting a self-sustaining quality to prosocial behavior, in that other people's reciprocity need not be the only incentive for helping (Dunn et al., 2008; Thoits & Hewitt, 2001). The psychological benefits of prosocial behavior create incentives for helping that do not depend on others' reciprocity.

Although self-worth mediates the effect of helping on meaningfulness, this phenomenon may be multiply determined and there may be additional, more basic, cognitive mechanisms responsible for it. Consulting existing research allows for speculation about what these basic cognitive processes might be. Recent research finds that mental simulation is broadly associated with higher perceptions of meaningfulness (Waytz et al., 2015). For example, one study finds that thinking about how important life events might never have occurred increases perceptions of meaningfulness (Kray et al., 2010). Helping other people might trigger processes of mental simulation of these other people's mental states and of the positive consequences of helpers' own actions. In contrast, self-interested actions may be less likely to trigger simulation of others' mental states. Testing whether helping affects mental simulation – and in turn, meaningfulness – may be a productive avenue for future research.

Deeper understanding of the relationship between helping and meaningfulness has not only theoretical implications, but also applied ones. Helping is associated with more tight-knit and trusting communities (Bowles & Gintis, 2003; Henrich et al., 2011). Believing that one's life is meaningful is associated with a number of important markers of psychological health, including lower risk of depression and suicide, and better physical health (Harlow, Newcomb, & Bentler, 1986; Taylor et al., 2000). Understanding how and when helping increases meaningfulness can therefore aid researchers understand how to promote greater personal as well as societal well-being.

## Notes

1. Including all of the four mediators, as well as happiness, in a mediation analysis did not materially affect the results reported in the main text.
2. Because the effect of prosocial behavior on perceptions of personal control was marginal, I also conducted an additional mediation analysis with personal control included as a mediator in addition to self-worth and

social connection. The results were not materially different from the ones described in the main text.

## Disclosure statement

No potential conflict of interest was reported by the author.

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