



The Relationship Between Prosociality, Meaning, and Happiness in Everyday Life

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Abstract

Prosocial behaviors benefit others, but what benefits do they hold for those who enact them? Prosociality can enhance the actor's well-being, yet whether it is one's sense of happiness or meaning that is impacted, and how this plays out in everyday life, has received limited attention. We address this gap in knowledge by examining how prosociality is related to daily meaning and happiness across two large daily diary studies in two countries. Study 1 ($N=1140$) revealed that changes in one's *subjective sense* of prosociality was uniquely associated with both daily meaning and happiness. Study 2 ($N=217$) found that self-reported prosocial *behavior* was also clearly linked to increases in daily meaning, and modestly associated with daily happiness. Altogether, our findings suggest that the subjective sense of prosociality is associated with meaning and happiness, and that performing prosocial acts may be particularly relevant to experiencing meaning.

Keywords Prosocial behavior · Well-being · Meaning in life · Happiness · Daily diary study

Prosocial behaviors may be beneficial for others, but how does performing everyday prosocial acts benefit those who enact them? While previous work has shown that prosociality may influence well-being broadly (see Hui et al., 2020 for review), the question of how it affects specific components of well-being in everyday life remains largely unanswered. Of the well-being components, there is reason to suspect that prosocial behavior may be particularly relevant to experiencing meaning in life (Dakin & Bastian, 2022; Dakin et al., 2021; Klein, 2017; Van Tongeren et al., 2016), compared to experiencing happiness (Aknin et al., 2020; Hui et al., 2020). However, the everyday relationship between prosociality and meaning, and its comparative association with happiness, has not been rigorously examined. The present work set out to address this gap by drawing on data from two large daily diary studies. We look at how both *feeling* prosocial and *behaving* prosocially are related to

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meaning and happiness, and answer the question: how is prosociality associated with well-being in everyday life?

1 Prosocial Behavior and Meaning

Prosocial behaviors are defined as actions performed to intentionally enhance the well-being or welfare of another person(s), and may include volunteering, making charitable donations, or offering help to others (Penner et al., 2005). While prosocial acts increase the well-being of their beneficiary by definition, they can also have benefits for the actor's own well-being that tend to exceed the gains of self-interested behavior (e.g., Dunn et al., 2008; Klein, 2017). Performing prosocial acts may be relevant to various forms of well-being, however, one form of well-being that prosociality may be particularly impactful on is meaning in life.

There are clear theoretical reasons for why engaging in prosocial behaviors should heighten one's perceptions of meaning, particularly the facets of existential mattering/significance and purpose which largely comprise meaning in life (Costin & Vignoles, 2020; George & Park, 2017; Martela & Steger, 2016). Prosocial behaviors are beneficial for others and society, and so enacting them may lead to increased social approval. This in turn can facilitate one's sense of purpose and mattering because one can feel that their existence is important to others and society. Relatedly, prosocial behaviors may contribute to meaning in life because they correspond to commonly held cultural values of benevolence and universalism (Schwartz, 2012). By manifesting these values in one's behavior, an individual may feel that they are a good 'cultural actor' and experience heightened meaning (Sheldon & Krieger, 2014). Finally, prosocial behaviors may lead to increased social connections with beneficiaries, which in turn can facilitate meaning (Van Tongeren et al., 2016). In sum, if people feel that their existence is made meaningful by making a positive impact in the lives of others (Martela, 2020), then performing prosocial acts should be a powerful way to increase one's sense of meaning in their life.

In line with the above theorizing, studies have begun to reveal how prosociality and meaning are related. Meaning has been shown to be correlated with being a "giver" (Baumeister et al., 2013), and forms of prosociality such as volunteering have been shown to correlate with meaning (Sherman et al., 2011), and predict increases in meaning over time (Stephote & Fancourt, 2020). Furthermore, experimental studies have provided causal evidence that performing prosocial actions (such as writing letters of gratitude, or spending money on others) leads to increases in perceptions of meaning (e.g., Klein, 2017; Martela & Ryan, 2016b; Van Tongeren et al., 2016), and that this relationship remains when controlling for happiness (Klein, 2017; Study 3). However, this experimental evidence has generally relied on smaller, underpowered samples and has not been undertaken in naturalistic settings.

Much of the aforementioned work on the prosociality–meaning relationship has been conducted using cross-sectional or experimental designs. However, some recent work has begun to employ naturalistic designs to hint at how prosociality is related to meaning in everyday life. A small diary study by Martela et al. (2018; Study 3; $N=85$) found that beneficence (one's general sense of their prosocial impact¹) is associated with meaning on a day-to-day basis even when accounting for the satisfaction of other basic

¹ While beneficence is related to self-reported prosocial behavior, Martela and Ryan (2016a; Study 1) found that they were only moderately correlated ($r=.34$).

psychological needs. Relatedly, Choi et al. (2017) examined in a South Korean sample how various behaviors were related to well-being and found that episodes of volunteering were related to momentary experiences of meaning.

While these studies give some indication that prosociality and meaning are related in daily life, they have only measured how one's general sense of prosocial impact (beneficence; Martela et al., 2018) or a specific sub-type of prosocial behavior (volunteering; Choi et al., 2017) are associated with meaning. As such, it is not yet clear whether *prosocial actions in general* (such as offering help, donating money, or providing emotional support) are associated with increased sense of meaning in everyday life. Furthermore, to our knowledge, these previous studies did not control for meaning at the previous time-point. This can be informative as doing so can reveal if performing a prosocial act on one day is associated with an increase in meaning *compared to the previous day*. To address these gaps in prior research, there is a need for a focused and robust examination of how prosocial acts are related to increases in the meaning people experience in their everyday life.

2 Is Prosociality More Impactful on Meaning, or Happiness?

As an alternative to meaning in life, a separate stream of research has examined whether prosociality impacts “hedonic” aspects of well-being, such as happiness (see Aknin et al., 2020 and Hui et al., 2020 for reviews). While meaning is defined with facets such as significance and purpose (Martela & Steger, 2016), happiness is usually defined as experiencing high positive affect and low-to-absent negative affect (e.g., Deci & Ryan, 2008). The relationship between prosocial behavior and happiness has been found across a number of studies, with work highlighting the impact that prosocial spending (e.g., Aknin et al., 2013; Dunn et al., 2008) and acts of kindness (e.g., Nelson et al., 2015) can have on happiness or positive affect. However, the effect of prosociality on hedonic well-being is somewhat inconsistent. While several studies have linked prosociality with positive affect (e.g., Aknin et al., 2013), there is less consistent evidence that prosociality *decreases* negative affect (e.g., Alden & Trew, 2013; Mongrain et al., 2011; Nelson et al., 2016; Ouweneel et al., 2014). Furthermore, despite the amount of work detailing the relationship between prosociality and happiness, both a recent large-scale replication project conducted by Aknin et al. (2020) and meta-analysis by Hui et al. (2020) have revealed that the relationship between prosociality and happiness is only modest. As such, the relationship between prosocial behavior and hedonic well-being may be smaller and less consistent than previously thought. While there is overlap in the kinds of experiences that give meaning and happiness in life, prosocial acts may be more relevant to experiencing meaning than happiness.

A handful of studies have measured both meaning and happiness to see how prosociality is differentially related to them. Choi et al. (2017) found that volunteering was associated with experiencing meaning and happiness, but that the relationship with meaning was significantly stronger than it was for happiness. Further, Baumeister et al. (2013) reported that happiness is negatively related to being a “giver” when meaning is controlled for.

Therefore, there is reason to investigate whether prosocial acts have a *unique* association with experiencing happiness, or whether this relationship is accounted for by both variable's relationship with meaning. Establishing the unique relationship that prosociality has with meaning or happiness is important to determine what forms of well-being people may reliably experience from performing prosocial behaviors in everyday life.

3 The Present Studies

The present studies set out to extend previous work on the prosociality–well-being relationship in three key ways. First, we examined the relationship between prosociality and meaning in daily life by drawing on two large samples from two different Western countries. This allowed for a robust attempt to replicate previous work on the prosociality–meaning link that has relied on smaller under-powered samples, which can be problematic for establishing reliable effects (Fralely & Vazire, 2014). Second, the present research sought to determine if prosociality was *uniquely* associated with both happiness and meaning, or whether it was more relevant toward one form of well-being over the other. Third, we used ‘half-lagged’ multi-level models to test if prosociality was associated with increases in well-being *compared to the previous day* (Kalokerinos et al., 2019; Weinstein & Ryan, 2010). We examined these questions across two diary studies that both drew on different samples (i.e., undergraduates vs. Mechanical Turk workers) and different measures of prosociality (i.e., subjective sense of prosocial impact vs. self-reported prosocial acts).

4 Study 1

In Study 1 we drew on archival daily diary data to initially test the relationship between prosociality and both daily meaning and hedonic well-being (i.e., happiness and fun). Specifically, we examined the within-person relationships between subjective prosociality and increases in both meaning and hedonic well-being while controlling for the other. The data for Study 1 was taken from the *Daily Life Study*, a 13-day diary study run in Dunedin, New Zealand on a large undergraduate sample between 2011 and 2014. Only data from 2012 to 2014 was included in our analysis given that these were the years where prosociality and meaning were both measured.

5 Method

5.1 Participants and Procedure

Data were analysed from 1140 participants who completed daily surveys for the study between 2012 and 2014 for a total of 14,820 observations. Participants on average completed 11.49 of their 13 daily surveys ($SD=1.89$). The sample comprised young adults studying at the University of Otago, New Zealand (352 male; 788 female; $M_{Age}=19.60$,

$SD_{Age} = 1.67$). Participants who signed up for the study came into the laboratory to complete an initial survey involving demographic and trait measures on Day 1. For the next 13 days (Days 2–14), participants responded to daily surveys asking questions about their well-being, mood, health behaviors, and other daily experiences.² Starting on Day 2, participants were sent a daily email with a link to the daily diary survey. Participants could access and complete each survey anytime between 3 and 8 pm each day, and were sent a reminder email at 5 pm if they had not already completed their survey for the day. Following the diary period, participants returned to the lab (Day 14) for a completion survey and debriefing. The study was approved by the University of Otago Ethics Committee (approval number: 10/177).

5.2 Materials

5.2.1 Subjective Prosociality

Daily prosociality was measured using a single item derived from an 8-item flourishing scale that participants completed each day on a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*; Diener et al., 2010). The item captured one's *subjective sense* of having a prosocial impact throughout the day ("*Today, I actively contributed toward the happiness and well-being of others*"), and corresponded closely to a widely accepted definition of prosociality (Jensen, 2016).

5.2.2 Meaning Measure 1: Meaningful Experience

One measure of daily meaning involved participants indicating their level of meaningful experiences each day. Participants responded to the question "*Overall, how meaningful were your experiences today?*" on a 5-point scale (0 = *not at all meaningful*; 4 = *A great deal meaningful*).

5.2.3 Meaning Measure 2: Life Engagement

A second measure of daily meaning was taken from scores on a 5-item 'life engagement test' adapted to a daily format (Scheier et al., 2006). Items in the scale measured the amount of purpose (e.g., "*Today, there was enough purpose in my life*") and mattering (e.g., "*Today, the things I did were all worthwhile*") one attributed to their daily life. A 7-point version of the scale was used in 2012 ($R_{KF} = 0.97$; $R_C = 0.80$), and a 5-point scale was used in 2013 and 2014 ($R_{KF} = 0.98$; $R_C = 0.82$). Both versions used a *Strongly disagree*—*Strongly agree* anchoring format.

² There was also an experience sampling component where participants responded to 4 texts throughout each day regarding their current mood states. However, those data were not analyzed in the present study.

Table 1 Descriptive statistics for daily measures

	<i>M</i>	<i>SD</i> (W-P)	<i>SD</i> (B-P)	Range
Subjective prosociality	4.63	1.04	1.45	1–7
Meaningful experience	1.74	0.80	1.00	0–4
Life engagement (7p)	4.60	0.85	1.15	1–7
Life engagement (5p)	3.53	0.62	0.83	1–5
Happiness	3.28	0.65	0.80	1–5
Fun experience	1.76	0.78	0.92	0–4

W-P within-person; *B-P* between-person; For the daily life engagement scores, we have included descriptive statistics for both the 5-point and 7-point versions used here on alternate years. However, for all inferential statistics (i.e., correlations and multilevel models) we used a scaled version of the measure which was used across all participants/years

Table 2 Within-person and between-person correlations matrix for daily measures

	(1) Pros	(2) Me-ex	(3) Life-en	(4) Happ	(5) Fu-ex
(1) Subjective prosociality	–	.38	.47	.40	.42
(2) Meaningful experience	.55	–	.54	.38	.61
(3) Life engagement	.69	.63	–	.42	.45
(4) Happiness	.63	.58	.60	–	.50
(5) Fun experience	.54	.74	.50	.74	–

Between-person correlations are reported below the diagonal and within-person correlations are reported above; All correlations significant at $p < .001$ level; Life engagement scores were scaled and used across participants regardless of whether they completed the 5-point or 7-point version of the scale

5.2.4 Hedonic Well-Being Measure 1: Happiness

A single-item measure of daily happiness was derived from a circumplex daily mood measure. Participants responded to the statement “*Today I felt... happy*” on a 5-point scale (1 = *not at all*; 5 = *extremely*).

5.2.5 Hedonic Well-Being Measure 2: Fun Experience

A second measure of daily hedonic well-being was taken from participants indicating how ‘fun’ their experiences had been each day. Participants responded to the question “*Overall, how much fun did you have today?*” on a 5-point scale (0 = *no fun*; 4 = *a great deal of fun*).³

³ Participants also indicated their daily ‘enjoyment’ and ‘pleasure’ on certain years which appeared relevant to hedonic well-being. However, given that these questions were only included in the 2011 and 2012 versions of the survey, they were omitted from analyses.

6 Results

6.1 Statistical Analysis

We conducted our analyses in R using the *lme4* package (Bates et al., 2015). We ran two-level models in which days ($N=13$) were nested within persons ($N=1140$). To aid interpretability and reduce convergence issues, all variables were standardized and scaled. Moreover, all measures of prosociality, meaning, and hedonic well-being were participant mean centered (i.e., participant's mean was subtracted from each score) to create between-person and within-person effects⁴ (Bolger & Laurenceau, 2013) and to allow scores to vary randomly across participants at the person-level (i.e., an intercept-only model). Descriptive statistics for measures are included in Tables 1 and 2 includes both the within- and between-person correlations between all measures. For a breakdown of how the within- and between-person correlations are calculated, please see the supplementary materials.

6.2 Description of Models

We ran four multilevel models that examined the relationship between daily prosociality and change in each of the four well-being variables. We focused on 'within-person' prosociality as our 'predictor' variable of interest, with this variable capturing one's subjective sense of prosociality on a given day compared to their usual mean. Models 1 and 2 examined the relationship between prosociality and change in daily meaning (Model 1: meaningful experience; Model 2: life engagement); Models 3 and 4 examined the relationship between prosociality and change in daily hedonic well-being (Model 3: happiness; Model 4: fun experience).

Following suggestions from Bolger and Laurenceau (2013), each model included a number of co-variates. First, given our interest in 'within-person' prosociality, each model controlled for the 'between-person' effect of prosociality. Second, to account for any effects associated with the passage of time, we included a 'day' variable which indexed the 13 days of the measurement period. Third, each model controlled for autoregression by controlling for scores on the well-being variable from the previous day ($i - 1$; Bolger & Laurenceau, 2013; Kalokerinos et al., 2019; Weinstein & Ryan, 2010). This use of a 'half-lag' allowed us to model *change* in the model's well-being variable (from $i-1$ to i) as a function of prosociality. Finally, to examine the *unique* relationship that prosociality shared with both meaning and hedonic well-being, each model controlled for the 'opposite' well-being variables. In other words, when examining the relationship between prosociality and meaning (Models 1 and 2) we controlled for the within- and between-person effects of the two hedonic well-being measures (happiness and fun experience). Conversely, the models that examined the relationship between prosociality and hedonic well-being (Models 3 and 4) controlled for the within- and between-person effects of the two meaning measures (meaningful experience and life engagement).⁵ Ultimately, the models in Study 1 tested if experiencing a greater sense of subjective prosociality on a given day (i) compared to usual

⁴ When we refer to 'effects' in the models and results sections, these represent statistical effects, not causal effects.

⁵ In addition to the models reported in the main text, we also ran cross-lagged models testing if change in subjective prosociality (Study 1) or the incidence of prosocial acts (Study 2) on one day ($i-1$) predicted change in well-being on the subsequent day (i). The theoretical plausibility of prosociality affecting well-being on the following day is uncertain, so we have only included these analyses and our interpretation in the supplementary materials.

Table 3 Multi-level models (Study 1)

	Parameter	β	95% CI	<i>p</i> value	ICC	<i>N</i> (observations)
<i>Model 1</i>	<i>Meaningful experience</i>				.23	1132 (10,631)
	Intercept	-.00	-.02, .02	.009		
	W-P prosociality	.12	.10, .13	<.001		
	B-P prosociality	.13	.10, .17	<.001		
	Days	-.02	-.04, -.01	<.001		
	W-P happiness	.05	.03, .06	<.001		
	B-P happiness	-.02	-.06, .01	.225		
	W-P fun experience	.40	.39, .42	<.001		
	B-P fun experience	.39	.35, .42	<.001		
	Meaningful experience <i>i</i> - 1	-.01	-.02, .00	.149		
<i>Model 2</i>	<i>Life engagement</i>				.29	1132 (10,725)
	Intercept	-.01	-.04, .02	<.001		
	WP-prosociality	.22	.21, .24	<.001		
	BP-prosociality	.34	.30, .37	<.001		
	Days	.03	.02, .04	<.001		
	W-P happiness	.14	.12, .15	<.001		
	B-P happiness	.16	.11, .20	<.001		
	W-P fun experience	.17	.16, .19	<.001		
	B-P fun experience	.02	-.02, .06	.246		
	Life engagement <i>i</i> - 1	.01	.00, .02	.044		
<i>Model 3</i>	<i>Happiness</i>				.24	1133 (10,701)
	Intercept	.01	-.02, .03	<.001		
	W-P prosociality	.19	.18, .21	<.001		
	B-P prosociality	.21	.18, .25	<.001		
	Days	-.04	-.06, -.03	<.001		
	W-P meaningful experience	.12	.11, .14	<.001		
	B-P meaningful experience	.17	.13, .21	<.001		
	W-P life engagement	.17	.16, .19	<.001		
	B-P life engagement	.11	.07, .16	<.001		
	Happiness <i>i</i> - 1	.04	.03, .06	<.001		
<i>Model 4</i>	<i>Fun experience</i>				.20	1132 (10,672)
	Intercept	.01	-.02, .03	.003		
	W-P prosociality	.16	.14, .17	<.001		
	B-P prosociality	.13	.10, .17	<.001		
	Days	-.03	-.04, -.02	<.001		
	W-P meaningful experience	.38	.37, .40	<.001		
	B-P meaningful experience	.36	.33, .39	<.001		
	W-P life engagement	.09	.07, .11	<.001		
	B-P life engagement	-.04	-.08, -.00	.026		
	Fun experience <i>i</i> - 1	.01	.00, .03	.044		

β standardized beta; *CI* standardized confidence interval; *ICC* intra-class correlation; *W-P* within-person; *B-P* between-person; *i* - 1 score from the previous day

was associated with experiencing increases in well-being on that day (i) compared to the previous day ($i-1$).

6.3 Results of Models

Results for all models are displayed in Table 3. Intra-class correlation statistics for all models were between 0.20 and 0.30, indicating that the majority of the variance in the well-being variables was at the within-person level. The modelling revealed that within-person prosociality (i.e., W-P prosociality) was uniquely positively associated with change in all the meaning (Models 1 and 2) and hedonic-wellbeing (Models 3 and 4) measures. In other words, on days when a person experienced an increase in their sense of having a prosocial impact (compared to their average), they tended to experience an increase in their sense of meaning and hedonic well-being on that day compared to the previous day. A post-hoc simulation-based power analysis found that each of the four models had 100% power to detect the effect of prosociality in each model (Lafit et al., 2021; see supplementary materials for power analysis specification).

6.4 Discussion

Study 1 drew on a large sample from archival data to test for the relationship between subjective prosociality and changes in both meaning and hedonic well-being in everyday life. The modelling revealed that on days when a person reported having greater prosocial impact than usual, they experienced unique increases in their sense of meaning and hedonic well-being compared to the previous day. These findings further previous research by using a highly powered sample to show the day-to-day relationship between feeling prosocial and experiencing positive well-being. However, a notable limitation of Study 1 was that it was conveniently drawn from a large archival study, and used a prosociality measure that only captured one's *subjective sense* of having a prosocial impact. While this provides useful information, the emphasis on subjective appraisal does not indicate how performing actual prosocial *behaviors* in daily life is related to meaning and happiness. As such, it remains uncertain if prosocial acts themselves relate to experiencing daily well-being, or if it is just perceiving oneself as prosocial that produces this effect. We sought to address these limitations by next running a study focused specifically on prosociality and well-being that included a self-reported measure of daily prosocial acts.

7 Study 2

Study 2 sought to again test if daily prosociality was uniquely associated with both meaning and happiness when using a reported behavioral measure of prosociality and a population from a different country. Rather than using a general question capturing *perception* of one's prosociality, we asked participants to record and describe any specific prosocial *behavior* they performed each day. We then used this measure to test if the enactment of prosocial behaviors was associated with increases in meaning or happiness on days when these acts were undertaken.

8 Method

8.1 Participants and Procedure

Sample size was determined for the study by gathering the maximum number of participants permitted within budget constraints. Three-hundred and seventeen American MTurk workers were invited to participate in a 3-week daily diary study and complete an initial screening survey. Participants were paid (US) \$3 for completing the screening survey, and \$1 for each of the daily surveys they completed (including a bonus if they completed at least 60% of the daily surveys). Of the 317 initial respondents, 17 did not complete the screening survey, 30 participants failed attention checks, and 53 declined further participation in the daily surveys. This left a final sample of 217 participants for analyses (113 male, 102 female, 2 non-binary; $M_{Age}=36.47$, $SD_{Age}=9.47$). During the diary period, participants were sent an email at 8 pm each night (their local time) with a link to the daily survey and instructed to complete it before 2am to be paid for the survey. On average, the 217 participants completed 16.38 of their 21 daily surveys ($SD=5.46$), for a total of 3,555 observations. All participants had an average daily survey completion time that was greater than one-third of the median completion time (i.e., > 154 seconds), so no further data was excluded. Study 2 was approved by the University of Melbourne Human Ethics Advisory Group (approval number: 1955449.1).

8.2 Materials

8.2.1 Daily Prosocial Act

We measured the incidence of daily prosocial acts using a self-report measure adapted from Weinstein and Ryan (2010). In each daily survey, participants were asked “*Did you do anything prosocial today?*” (0=no; 1=yes) while being provided with a definition of a prosocial act.⁶ Participants who indicated ‘yes’ were then asked to briefly describe the nature of the prosocial act. Of the 3555 observations, 1059 included a prosocial act.

Prior to data analysis, the first and second authors went through 601 (56.8%) of the prosocial act descriptions and independently rated whether the described act appeared prosocial or not (1=yes; 2=no). Inter-rater reliability was high ($\kappa=0.81$), and so first author’s judgments were used to re-code any observations that had provided dubious instances of prosociality as ‘not having a prosocial act’ (see supplementary materials for complete details of screening and re-coding process). Following this process, 110 instances were recoded as ‘not having performed a prosocial act’ (i.e., as ‘0’), leaving 949 observations with prosocial acts. This ‘cleaned’ version of the prosocial act variable was used for analyses.⁷ Of the 217 participants, 2 (1%) reported performing prosocial acts on all their recorded observations, 50 (23%) reported no prosocial acts, and the remaining 165 (76%) reported a mixture of prosocial and non-prosocial days.

⁶ Prosocial acts were defined for participants as engaging in “any act(s) that involved helping or benefiting someone else, or doing something for a good cause”.

⁷ While we considered this ‘cleaning’ of the prosocial act variable to be important prior to analyses, using the cleaned version did not significantly alter the pattern of results when compared to the original/raw version of the prosocial act variable.

Table 4 Descriptives and correlations matrix for daily measures

	<i>M</i>	<i>SD</i> (W-P)	<i>SD</i> (B-P)	(1)	(2)	(3)
(1) Prosocial act	0.27	0.31	–	–	.15	.11
(2) Meaning	4.59	0.93	1.84	.28	–	.47
(3) Happiness	4.29	1.07	1.83	.18	.83	–

W-P within-person; *B-P* between-person; Between-person correlations are reported below the diagonal and within-person correlations are reported above; All correlations significant at $p < .001$ level except for the between-person correlation between prosocial act and happiness ($p = .009$)

8.2.2 Daily Meaning

Daily sense of meaning was measured with a two-item measure derived from Newman et al. (2018), including items “How meaningful did you feel your life was today?”, and “How much did you feel your life had purpose today?”. Participants indicated their agreement with each statement on a 7-point scale (1 = not at all; 7 = very much). Scores for this measure were computed by calculating the mean of both items ($R_{KF} = 1.00$; $R_C = 0.86$).

8.2.3 Daily Happiness

Participants indicated their daily happiness using a single item measure that was included within a broader daily emotion measure adapted from the Affect Valuation Index (Tsai et al., 2006). Participants rated how much they had felt “Happy” over the course of the day on a 7-point scale (1 = not at all; 7 = very much).⁸

9 Results

9.1 Statistical Analysis

Statistical analyses were run in the same manner as in Study 1 using the *lme4* package with days ($N = 21$) nested within persons ($N = 217$). All variables were again standardized, scaled, and participant-mean centered, except for the prosocial act variable due to its binary nature (Nezlek, 2011). Descriptive statistics and both within- and between-person correlations for all relevant measures are included in Table 4 below.

⁸ Study 2 also included a one item measure of daily life satisfaction. This measure showed a very similar pattern of results to daily happiness, and its relevant analyses are included in the supplementary materials.

Table 5 Multi-level models (Study 2)

	Parameter	β	95% CI	<i>p</i> -value	ICC	<i>N</i> (observations)
Model 1	<i>Meaning</i>				0.48	213 (3040)
	Intercept	-.07	-.11, -.02	.045		
	Prosocial act	.14	.10, .19	<.001		
	Prosocial proportion	.08	.01, .14	.024		
	Days	.00	.00, .01	.011		
	Meaning <i>i</i> - 1	0.05	.03, .06	<.001		
	W-P happiness	0.22	.20, .24	<.001		
	B-P happiness	0.67	.61, .73	<.001		
Model 2	<i>Happiness</i>				0.38	212 (3027)
	Intercept	.05	-.02, .12	.176		
	Prosocial act	.06	.00, .12	.034		
	Prosocial proportion	-.07	-.13, -.00	.045		
	Days	-.01	-.01, -.00	<.001		
	Happiness <i>i</i> - 1	.02	.00, .04	.014		
	W-P meaning	.27	.25, .29	<.001		
	B-P meaning	.67	.60, .73	<.001		

β standardized beta; *CI* standardized confidence interval; *ICC* intra-class correlation; *W-P* within-person; *B-P* between-person; *i* - 1 score from the previous day; Prosocial proportion = proportion of a participant's recorded observations/days where they reported a prosocial act

9.2 Description of Models

We ran two multi-level linear models testing if the incidence of prosocial acts on particular days was uniquely associated with increases in meaning (Model 1) or happiness (Model 2) compared to the previous day. As with Study 1, we controlled for a number of covariates. Specifically, we controlled for the effect of time, and controlled for the score on the well-being variable from the previous day. To account for a person's general tendency to perform prosocial acts (between-person effect), we controlled for the proportion of days in which a person had reported prosocial acts (prosocial proportion; Weinstein & Ryan, 2010).⁹ This ensured that the effect of the prosocial act predictor variable approximated the 'within-person' effect of prosociality. Finally, to gauge unique associations, we again controlled for the within- and between-person effect of the opposite well-being variable (i.e., Model 1 tested the effect of prosociality on meaning while controlling for happiness, and Model 2 tested the effect of prosociality on happiness while controlling for meaning). Ultimately, the models in Study 2 tested if performing a prosocial act on a given day (*i*) was associated with experiencing increases in well-being on that day (*i*) compared to the previous day (*i* - 1), while also controlling for how prosocial one is in general.

⁹ An alternative approach to modelling the binary prosocial variable is to person-mean center the variable and separate out the within-person and between-person effects (Bolger & Laurenceau, 2013), as we had in Study 1 with the continuous prosociality variable. However, other authors recommend leaving binary predictor variables un-centered (Nezlek, 2011), and indeed, extracting out within-person and between-person effects for a binary variable does complexify interpretation of our effects. Therefore, we chose to leave the prosocial act variable in Study 2 un-centered, while still controlling for the between-person effect of prosociality by accounting for prosocial proportion (Weinstein & Ryan, 2010). In any case, taking the 'centering' approach produces the same pattern of significant findings, and we have reported this alternative modelling in the supplementary materials.

9.3 Results of Models

Results of Models 1 and 2 can be seen in Table 5. The intra-class correlation coefficients indicated that between one-third to half of the variance in the well-being variables was at the between-person level. Model 1 revealed that on days when prosocial acts were performed, participants' sense of meaning increased significantly compared to the previous day ($\beta=0.14$, $p<0.001$), even when accounting for happiness. Model 2 revealed that prosocial acts were also related to unique increases in happiness. However, the relationship between prosocial acts and happiness was quite small and only just reached statistical significance ($\beta=0.06$, $p=0.034$). As with Study 1, we ran post-hoc simulation-based power analyses for Models 1 and 2. For Model 1, analysis revealed that there was 100% power to detect the effect of prosociality on meaning, while for Model 2 there was 89.6% power to detect the effect of prosociality on happiness¹⁰ (Lafit et al., 2021; see supplementary materials for power analysis specification).

9.4 Discussion

Study 2 sought to further explore the relationship between prosociality and forms of well-being by examining how self-reported prosocial acts were associated with increases in daily meaning and happiness. In alignment with Study 1, our modelling showed that on days when participants reported performing a prosocial act, their sense of meaning increased significantly compared to the previous day, even when accounting for the effect of happiness. While prosocial acts were also associated with increased happiness when accounting for meaning, this effect was more marginal, particularly compared to the effect size observed in Study 2. This difference may have arisen due to the difference in demographics between the two studies, given the use of New Zealand undergraduates in Study 1, and American MTurk workers in Study 2. However, a more likely explanation for the different results is due to change in how prosociality was measured between the studies. While Study 1 showed that the *subjective feeling* of being prosocial is clearly associated with both meaning and happiness, Study 2's result suggests that performing prosocial *acts* may be more robustly associated with meaning compared to happiness. However, we note that this interpretation is intuitive, and we have not performed a statistical test comparing the relative effect sizes of prosocial acts with both meaning and happiness.¹¹

10 General Discussion

The present work drew on two large diary studies to examine how daily prosociality was associated with increases in both meaning and happiness in everyday life. Study 1 found that subjective prosociality was uniquely associated with both meaning and happiness. Study 2, using a self-report measure of prosocial *behavior*, revealed that daily prosocial acts were uniquely associated with increases in meaning, but modestly (though still significantly) related to happiness.

¹⁰ Due to constraints with the power analysis software, the power analyses treated prosocial act as a continuous variable, even though it was measured as a binary variable (i.e., presence vs. absence of prosocial act; see supplementary materials for more details).

¹¹ Given our use of multi-level modelling and different co-variates in Study 2's models, we are not aware of an appropriate statistical test to compare the meaning and happiness beta sizes across these models.

The present findings have implications for research on the relationship between prosocial behavior and well-being. The current studies formed the first focused and well-powered examination of the relationship between prosociality and meaning in everyday life. This extends previous experimental work showing the effect that prosocial behavior may have on meaning in life (e.g., Klein, 2017; Van Tongeren et al., 2016), by conceptually replicating these findings using large samples in naturalistic settings. It also complements previous daily diary or experience sampling studies showing that beneficence (Martela et al., 2018) and volunteering (Choi et al., 2017) are related to meaning at the daily level. The present work extends these previous findings by showing that prosocial acts *in general* are associated with experiencing heightened meaning. Our studies also further this previous work by using half-lagged models to show not only that daily prosociality and meaning are correlated, but that the incidence of prosocial acts on one day is associated with an *increase* in meaning compared to the previous day. Ultimately, our findings indicate that performing prosocial behaviors in everyday life is reliably associated with increases in one's sense that their life is meaningful.

The present findings have further implications for a largely unanswered question in the literature – is prosociality relevant to experiencing meaning, happiness, or both? Study 1 showed that the sense of being prosocial is associated with meaning and happiness, suggesting that making a positive self-appraisal of one's prosocial impact may engender feelings of meaningfulness, and also positive emotion. However, Study 2 revealed that reporting actual prosocial acts was more marginally associated with happiness. Some previous work has focused on the way that prosocial behavior can increase happiness (e.g., Akinin et al., 2013; Dunn et al., 2008; Nelson et al., 2015). However, the present findings suggest that prosocial behavior and happiness may share a more modest relationship than previously thought (e.g., Akinin et al., 2020; Hui et al., 2020). This further aligns with previous work showing that the positive relationship between prosociality and happiness can dissipate when meaning is controlled for (Baumeister et al., 2013), and that instances of volunteering share a significantly stronger relationship with experiencing meaning compared to happiness (Choi et al., 2017). In summary, our findings suggest that while viewing oneself as prosocial is related to happiness and meaning, actually performing prosocial acts may be more robustly associated with meaning. Therefore, future work exploring the well-being benefits of prosocial behavior may better focus on how prosocial behavior increases perceptions of meaning, rather than hedonic aspects of well-being.

One reason that prosocial behavior could be more robustly associated with meaning is the effort and costliness implicit within many prosocial acts. Performing prosocial behaviors to benefit others usually involves some level of sacrifice for the actor, be it of time, money, effort, or other resources. This element of cost may be experienced as hedonically-negative, given that happiness is generally associated with being the recipient of resources (Baumeister et al., 2013) or good deeds (Hofmann et al., 2014). Costliness and effort, however, may contribute more to perception of meaning (Dakin et al., 2021; Olivola & Shafir, 2013). Therefore, the implicit element of cost within prosocial behaviors may partially explain why prosocial acts are more linked with the experience of meaning compared to happiness. However, we cannot infer from the present data that prosocial acts share a significantly stronger relationship with meaning compared to happiness, or that costliness of prosocial acts is the mechanism that determines the differing relationships.

10.1 Limitations and Future Directions

The present work has addressed previous shortcomings in the literature by using ecologically-valid designs and large samples to examine how daily prosociality is associated with meaning and happiness. However, our approach was not without limitations. Regarding the *directionality* of effect, our argument was based on previous findings which show that prosocial behavior *causes* increases in meaning (as opposed to higher meaning motivating people to enact prosocial behaviors; Klein, 2017; Van Tongeren et al., 2016). The models that we have reported in the manuscript show that increases in subjective prosociality (Study 1) or the incidence of prosocial acts (Study 2) is associated with increases in meaning compared to the previous day. However, this does not provide proper evidence of directionality, with prosociality at one time point ($i - 1$) predicting changes in meaning at the next measurement point (i). Though we report fully-lagged analyses in the supplementary materials, we believe it is theoretically unclear whether prosocial acts performed on one day will reliably influence the meaning one experiences on the following day (as opposed to the same day). However, future work may better study this directionality by using more frequent measurement points (e.g., by employing an experience sampling design) to see if the incidence of a prosocial act at one point of the day (e.g., in the morning) predicts experiencing greater meaning later in that day (e.g., in the evening).

The present study treated all incidences of prosocial behavior as equal. However, prosocial behavior is a broad category (Penner et al., 2005), and work has shown that the effect of prosociality on well-being can be moderated by several factors (Hui et al., 2020), such as whether the behaviors are performed autonomously (Weinstein & Ryan, 2010), how costly the behaviors are (Olivola & Shafir, 2013), the individual's values (Hill & Howell, 2014), and the extent to which the act satisfies basic psychological needs (Hui & Kogan, 2018). It may be the case that certain types of or conditions for prosocial behavior contribute more to experiencing one form of well-being over the other, and this may be investigated in future research.

Finally, future work may do more to establish which facets of meaning in life are most influenced by prosocial acts. As mentioned in the introduction, there are several facets that comprise meaning in life (Baumeister & Vohs, 2005; Martela & Steger, 2016), and multi-dimensional scales have now been developed that measure individual facets of meaning, such as coherence, purpose, and significance/mattering (Costin & Vignoles, 2020; George & Park, 2017). Exploring if prosociality is particularly relevant to certain facets of meaning would be useful in furthering understanding of the mechanisms that allow prosocial acts to influence one's sense of meaning.

10.2 Conclusion

The present work was the first to conduct a focused and robust examination of how daily prosocial acts are associated with meaning and happiness in everyday life. Across a total of 1357 participants from two countries, our findings consistently showed that both feeling prosocial and performing prosocial acts were associated with increases in meaning compared to the previous day. Feeling prosocial was also robustly linked with experiencing daily happiness, and reporting prosocial acts shared a modest relationship with happiness. Ultimately, these findings highlight that people can experience increases in their well-being when they perform prosocial acts in everyday life. This increase manifests in feeling that life is meaningful, and can involve experiencing increased happiness as well.

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Author Contributions The first and final author conceived of the research idea and collected data for Study 2. Data for Study 1 was collected by the third author. Data analysis was performed by the second author and first author, with code in R being primarily written by the second author. The first author drafted the first version of the manuscript, and all other authors provided critical revisions and approved the final version.

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Data Availability The data that support the findings of Study 1 and 2, accompanying R code, and study materials are available from the corresponding author, BCD, upon reasonable request.

Declarations

Conflict of interest The authors have no conflicts of interest to disclose.

Ethical Approval Both studies presented in the manuscript received ethical approval. Study 1 was approved by the University of Otago Ethics Committee (Approval Number: 10/177). Study 2 was approved by the University of Melbourne Human Ethics Advisory Group (Approval Number: 1955449.1).

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